STB DOCKET NO. 42022[1]

FMC WYOMING CORPORATION AND FMC CORPORATION
v.
UNION PACIFIC RAILROAD COMPANY

Decided May 10, 2000

The Board addresses a complaint challenging the reasonableness of 16 rates. The Board finds that the defendant railroad has market dominance over the transportation involved with respect to 15 of the rates, but not with respect to the rate applicable to the transportation of coke. The Board further finds that the 15 rates that are subject to maximum rate regulation are unreasonably high. Maximum reasonable rates are prescribed and reparations are ordered.

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[1] This decision embraces STB Ex Parte No. 346 (Sub-No. 29a), *Rail General Exemption Authority — Petition of AAR to Exempt Rail Transportation of Selected Commodity Groups (Petition for Partial Revocation of Exemption for Coke).*

ACRONYMS USED

AAR	Association of American Railroads
AEI	automatic equipment identifiers
ARC	Alliance for Rail Competition
AREMA	American Railway Engineering and Maintenance-of-Way Association
BNSF	Burlington Northern and Santa Fe Railway Company
BRC	Belt Railway Company of Chicago
BTU	British thermal unit
CMP	constrained market pricing
CH	covered hopper cars
CN	Canadian National Railway Company
CNW	Chicago and North Western Railway Company
CP	Canadian Pacific Railway Company
CSXT	CSX Transportation, Inc.
COC	cost of capital
CTC	centralized traffic control

CWR	continuous welded rail
DCF	discounted cash flow
EAF	engineering adjustment factor
EIA	Department of Energy's Energy Information Agency
EOTD	end-of-train device
FMC	FMC Wyoming Corporation and/or FMC Corporation
FRA	Federal Railroad Administration
G&A	general and administrative
GAAP	generally accepted accounting principles
GDP	gross domestic product
GOH	general overhead ratios
GM	General Motors Corporation, Electro-Motive Division
GTM	gross ton-mile
HOTD	head-of-train device
I&I	inter/intra-train
IC	Illinois Central Railroad Company
ICC	Interstate Commerce Commission
IESNA	Illuminating Engineering Society of North America
IMRL	I&M Rail Link, LLC
IT	information technology
KCS	Kansas City Southern Railway
KCT	Kansas City Terminal Railway
L&D	loss and damage
LEPA	L.E. Peabody & Associates
LRP	long-range plan
LUM	locomotive unit-mile
M&S	materials and supplies
MGT	million gross tons
MGTM	million gross ton-miles
MOW	maintenance-of-way
MP	milepost
NS	Norfolk Southern Railway Company
NWS	National Weather Service
O/D	origin/destination
ORR	Overland Railroad
OTH	open-top hopper cars
PPI	producer price index
PRB	Powder River Basin
R-1	Annual Report Form R-1

RCAF-A	rail cost adjustment factor, adjusted for changes in productivity
RCAF-U	rail cost adjustment factor, unadjusted for changes in productivity
ROI	return on investment
ROW	right-of-way
R/VC	revenue-to-variable cost
SAC	stand-alone cost
SARR	stand-alone railroad
SFGT	speed factored gross ton
SP	Southern Pacific Transportation Company
SPLC	standard point location codes
STB	Surface Transportation Board
T&E	train and engine
TOFC/ COFC	trailer-on-flatcar/container-on-flatcar
UP	Union Pacific Railroad Company
URCS	Uniform Railroad Costing System
USOA	Uniform System of Accounts
WC	Wisconsin Central Ltd.
WCTL	Western Coal Traffic League
WSAC	weighted system average cost

BY THE BOARD:

I. COMPLAINT

By complaint filed October 31, 1997, FMC Wyoming Corporation and FMC Corporation (collectively, FMC) challenge the reasonableness of certain rail common carriage rates charged by the Union Pacific Railroad Company (UP) for various movements to and/or from FMC facilities at Westvaco and Kemmerer,WY and Don and Dry Valley, ID.[2] The complaint embraces 16 different rates, covering the transportation of six different commodities.

[2] All of the traffic at issue was transported under rail transportation contracts until those contracts expired in late 1997. When contract renegotiations were unsuccessful, UP established the common carriage rates that are challenged here. *See, FMC Wyoming Corp. & FMC Corp. v. Union Pacific RR Co.*, 2 S.T.B. 766 (1997), *aff'd sub nom. Union Pac. R.R. v. STB*, 202 F.3d 337 (D.C. Cir. 2000) (directing UP to establish a common carriage rate for interline movements of soda ash through the Chicago and East St. Louis, IL gateways for use in conjunction with a transportation contract with another railroad).

A. Soda Ash

The complaint challenges nine rates for the transportation of soda ash, which together account for most of the traffic (and revenues) covered by the complaint. These include:

- local rates[3] from Westvaco, WY to Clearing, Chicago and Irondale, IL (set at $47.46 per ton effective September 1, 1997; increased to $47.93 per ton effective January 1, 1999) (movements A, B and C, respectively).[4]

- a proportional rate from Westvaco, WY to Chicago, IL for through movements (set at $37.82 per ton effective January 1, 1998; increased to $38.20 per ton effective January 1, 1999) (movement E).

- a local rate from Westvaco, WY to Galt, IL (set at $42.79 per ton effective September 1, 1997; increased to $43.22 per ton effective January 1, 1999) (movement G).

- a local rate from Westvaco, WY to Lawrence, KS (set at $41.20 per ton effective September 1, 1997; increased to $41.61 per ton effective January 1, 1999) (movement H).

- a proportional rate from Westvaco, WY to Kansas City, MO for trainload through movements of export shipments moving through Port Arthur, TX (set at $32.35 per ton effective January 1, 1998; increased to $32.67 per ton effective January 1, 1999) (movement I).

- a proportional rate from Westvaco, WY to Kansas City, MO for single-car domestic through movements to Danville, KY or Port Neches, TX (set at $35.95 per ton effective January 1, 1998; increased to $36.31 per ton effective January 1, 1999) (movement J).

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[3] A "local rate" is a rate for transportation between two points on a single carrier's lines. A "proportional rate" is a rate set by a single carrier for applicability only to its portion of a "through movement" (a movement that originates on one carrier's line and terminates on the line of another carrier).

[4] The parties have applied a letter designation to each set of movements covered by the complaint. We use the designated letters in this decision as well.

- a local rate from Westvaco, WY to Portland, OR for trainload movements of export traffic (set at $32.36 per ton effective January 1, 1998) (movement K).

B. Sodium Bicarbonate and Sodium Sesquicarbonate

The complaint covers two rates that apply to both sodium bicarbonate and sodium sesquicarbonate:

- a local rate from Westvaco, WY to Irondale, IL (set at $49.00 per ton effective September 1, 1997; increased to $49.49 per ton effective January 1, 1999) (movement D).

- a proportional rate from Westvaco, WY to Chicago, IL for through movements (set at $39.27 effective September 1, 1997; increased to $39.66 effective January 1, 1999) (movement F).

C. Phosphorus

The complaint covers three rates that apply to movements of elemental phosphorus:

- a local rate from Don, ID to Westvaco, WY (set at $30.90 per ton effective September 1, 1997; increased to $31.21 per ton effective January 1, 1999) (movement L).

- a local rate from Don, ID to Lawrence, KS (set at $65.18 per ton effective September 1, 1997; increased to $65.83 per ton effective January 1, 1999) (movement M).

- a proportional rate from Don, ID to Chicago, IL for through movements to Carteret, NJ or Nitro, WV (set at $88.59 per ton effective September 1, 1997; increased to $89.48 per ton effective January 1, 1999) (movement N).

D. Phosphate Rock

The complaint also covers a local rate for shipments of phosphate rock in trainload service from Dry Valley to Don, ID (set at $4.62 per ton effective

September 1, 1997; increased to \$4.71 per ton effective January 1, 1999) (movement O).

E. Coke

Finally, the complaint covers a local rate for shipments of coke in single- and multiple-car service from Kemmerer, WY to Don, ID (set at \$15.23 per ton effective September 1, 1997; increased to \$15.53 per ton effective January 1, 1999) (movement P).

F. Traffic Summary

Table 1 shows the tonnages moved under each rate in the 16-month period for which evidence has been submitted (September 1997 through December 1998).

Table 1
TONNAGES FOR THE ISSUE TRAFFIC
(as determined by STB)
Sept. 1997 - Dec. 1998

Move	Origin/Destination Pair	UP Rate Per Ton	3rd QTR 97 Tonnage	4th QTR 97 Tonnage	1st QTR 98 Tonnage	2nd QTR 98 Tonnage	3rd QTR 98 Tonnage	4th QTR 98 Tonnage
	Soda Ash from Westvaco, WY to:							
A	Clearing, IL	\$47.46		198				
B	Chicago, IL	\$47.46	969					
C	Irondale, IL	\$47.46	1,176	3,937	6,893	2,647	2,721	2,644
E	Chicago, IL (interchange)	\$37.82			45,755	42,705	45,859	27,629
G	Galt, IL	\$42.79	884	1,691	1,490	297		
H	Lawrence, KS	\$41.20	1,563	4,475	8,966	7,917	7,915	2,570
I	Kansas City, MO (interchange) - Export	\$32.35			69,245	30,509	36,331	3,937
J	Kansas City, MO (interchange)	\$35.95			11,520	3,658	3,924	2,924
K	Portland, OR - Export	\$32.36			78,365	137,556	89,302	54,743
	Sodium Bicarbonate & Sodium Sesquicarbonate from Westvaco, WY to:							
D	Irondale, IL	\$49.00	575	779	1,877	828	913	1,898
F	Chicago, IL (interchange)	\$39.27	866	2,732	2,983	3,569	4,835	2,876
	Phosphorus from Don, ID to:							
L	Westvaco, WY	\$30.90	2,598	9,259	10,570	9,610	8,160	8,751
M	Lawrence, KS	\$65.18	2,352	8,069	8,884	8,269	7,969	8,741
N	Chicago, IL (interchange)	\$88.59	1,351	4,355	4,449	4,562	4,192	3,965
	Phosphate Rock from Dry Valley, ID to:							
O	Don, ID	\$4.62	264,497	137,435	111,092	684,847	424,315	196,006
	Coke from Kemmerer, WY to:							
P	Don, ID	\$15.23	10,928	27,231	28,399	33,084	30,227	24,257

Note: A blank cell in the table denotes no traffic in that quarter.

II. MARKET DOMINANCE INQUIRY

We may consider the reasonableness of a challenged rail rate only if the carrier has market dominance over the traffic involved. 49 U.S.C. 10701(d)(1), 10707(b), (c). Market dominance is "an absence of effective competition from other carriers or modes of transportation for the transportation to which a rate applies." 49 U.S.C. 10707(a). The statute precludes a finding of market dominance, however, where the carrier shows that the revenues produced by the movements at issue are less than 180% of the variable costs to the carrier of providing the service.[5] 49 U.S.C. 10707(d)(1)(A). We will first address this quantitative threshold, then proceed to a qualitative market analysis.

A. Quantitative Threshold

1. Preliminary Issues

Before computing the revenue-to-variable cost (R/VC) percentages for the movements at issue, we must consider two issues that FMC argues affect the calculation of UP's variable costs under our Uniform Railroad Costing System (URCS).[6]

a. Accounting Matters

FMC's first preliminary issue pertains to expenses recorded by UP in its annual reports to the Board.[7] FMC argues that UP has overstated expenses through both (a) the manner in which it has recorded assets acquired through mergers with other carriers[8] and (b) the treatment of recent merger-related restructuring costs and congestion-related costs. We consider and address these

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[5] "Variable costs" are those railroad costs that have been found to vary with the level of output.

[6] The URCS costing formulas reflect the extent to which different types of costs incurred in the rail industry have been found to change in direct proportion to changes in output. *See,* 49 U.S.C. 10707(d)(1)(B) (variable costs to be determined, for purposes of market dominance threshold computation, using URCS); *Uniform Railroad Costing System*, 5 I.C.C.2d 894 (1989) *(adopting URCS)*.

[7] To derive the unit costs for a particular carrier for a specific time period under URCS, we rely upon data that is contained in the annual reports (R-1s) submitted to us by that carrier. *See*, 49 CFR 1241.11.

[8] FMC argues that UP should have used book value, rather than the acquisition value, for assets acquired from other railroads that it acquired.

arguments more fully in *Western Coal Traffic League v. Union Pacific Railroad Co.*, 4 S.T.B. 685 (2000) (*WCTL*), and find them to be unpersuasive.

Briefly, UP accounted for its recent acquisitions of several other carriers[9] using the purchase accounting method. Our Uniform System of Accounts (USOA) expressly provides, at 49 CFR 1201, Instruction 2-15(c)(1), that when an acquisition results from a purchase (including mergers or consolidations other than pooling of interests), the amount to be included in Account 731, Road and Equipment Property, shall be the cost to the purchaser of the transportation property acquired. The USOA also provides that liabilities assumed by the purchaser, including restructuring costs incurred by the acquired carrier in anticipation of the consolidation, are a part of the cost of acquiring the company. UP followed the explicit provisions of the USOA in its treatment of the SP liabilities. *See also, WCTL.*

We conclude that restructuring and congestion-related expenses should not be excluded from the carrier's financial results because expenses of these types are not unusual or infrequent (in an accounting sense) for the railroad industry and are normally reported as operating expenses. As we explain more fully in *WCTL*, expenses of this sort are properly included in the URCS variable cost computations (for the year in which the expenses are incurred) as a normal part of railroad operations.

b. Cost of Capital

FMC's other preliminary issue concerns the cost of capital for the rail industry. We conduct a proceeding each year — in which all interested persons are afforded the opportunity to participate — to determine the cost of capital that was experienced by the rail industry in the preceding year.[10] FMC claims that our results are overstated, but FMC failed to participate in the annual capital cost

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[9] Southern Pacific Transportation Company (SP), Chicago and North Western Railway Company (CNW), and the Missouri-Kansas-Texas Railroad Company.

[10] *See, e.g., Railroad Cost of Capital — 1998*, 4 S.T.B. 46 (1999) *(1998 Cost)* (finding that in 1998 the rail industry experienced a composite after-tax cost of capital of 10.7%, based on subsidiary findings as to the composite current cost of debt, current cost of common equity capital, cost of preferred equity capital, and capital structure mix experienced by the railroads in 1998); *Railroad Cost of Capital — 1997*, 3 S.T.B. 176 (1998) (*1997 Cost*) (finding that in 1997 the industry experienced a composite cost of capital of 11.8%, based on subsidiary findings).

determinations[11] and cannot collaterally attack those determinations here.[12] Accordingly, to calculate variable costs here, we use the cost of capital figures that we have already determined in our annual rulemaking proceedings.

2. R/VC Computations

Based on the findings and computations in Appendix A, we find that on single-car movements of coke[13] UP's revenues for all of the time periods for which we have evidence are less than 180% of its variable costs. Accordingly, we must dismiss the portion of the complaint involving rates for transporting single-car movements of coke.

We also find that the rates assessed on soda ash movements interchanged at Chicago (movement E) resulted in R/VC levels that were at or above the 180% level in some quarters, but fell below the 180% level in the final quarter for which we have evidence.[14] Therefore, we consider the reasonableness of that rate, but FMC is not entitled to any rate relief when the rate yields revenues below the 180% R/VC level, as we do not prescribe a rate below the 180% jurisdictional R/VC floor.[15]

We find that all of the other challenged rates yield revenues in excess of 180% of variable costs. These findings are detailed in Appendix A.

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[11] One shipper group, the Western Coal Traffic League (WCTL), participated in the proceeding to determine the 1997 cost of capital. It complained generally that the figure produced by our procedure was too high given current economic conditions, the financial condition of the railroads, and the regulatory purposes of the cost of capital calculation. However, WCTL offered no specific evidence concerning the computation. Therefore, we were left with only the standard evidence submitted by the Association of American Railroads (AAR). *1997 Cost* at 1-2 n.1. No one other than AAR submitted any evidence in the proceeding to determine the 1998 cost of capital. *1998 Cost* at 46.

[12] *See, Montana v. United States,* 440 U.S. 147, 153 (1979); *Western Coal Traffic League v. ICC*, 735 F.2d 1408, 1411 (D.C. Cir. 1984) (agency need not "behave like Penelope, unraveling each day's work to start the web again the next day.").

[13] The challenged rate for movements of coke applies to both single- and multiple-car shipments.

[14] Consistent with the parties' evidentiary presentations, our R/VC computations are by calendar quarter.

[15] *See, West Texas Utilities Company v. Burlington Northern RR Co.*, 1 S.T.B. 638, 677 (1996) (*West Texas*).

B. Qualitative Analysis

We must now consider whether, for movements other than single-car movements of coke, FMC has transportation alternatives[16] that provide effective competition.[17] We find that UP has market dominance over the movements of phosphate rock, phosphorus, soda ash, and sodium bicarbonate and sesquicarbonate, but not over the multiple-car movements of coke.[18]

1. Coke

As noted above, the challenged coke rate applies to movements from Kemmerer, WY to FMC's Pocatello plant at Don, ID. UP transports 115,000 to 120,000 tons of coke annually over the 185-mile route between these points. UP

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[16] We now limit our qualitative market dominance analysis to intra- and intermodal competition, and no longer consider product or geographic competition in rail rate complaint proceedings. *See, Market Dominance Determinations*, 3 S.T.B. 937 (1998), *pets. for reconsideration & clarification denied,* 4 S.T.B. 269 (1999) (*July 1999 decision*) *pets. for judicial review pending sub nom. Association of American R.Rs. v. STB*, Nos. 99-1354, *et al.* (D.C. Cir. filed Aug. 30, 1999). In the *July 1999 decision*, at 281-83, we fully explained our basis for applying this limitation to the instant case, and we will not readdress that issue here.

[17] We reject FMC's broader argument that UP's market dominance over this traffic is demonstrated by the economic "penalties" that FMC claims UP has imposed on FMC for pursuing this litigation. FMC notes that, once it ceased using contract carriage for the traffic at issue, UP began assessing demurrage charges that had not applied under the former contract, and revoked the refunds on export traffic, mileage credits on FMC-owned cars, and volume incentives that FMC had enjoyed under its contract. FMC further asserts that UP has offered lower rates and other incentives to FMC's competitors as a means to punish FMC. As UP explains, however, the specific incentives that it offers to contract shippers are the result of negotiations and depend on each side's willingness to make commitments. Thus, it is not unexpected that rates and incentive provisions offered to contract shippers would be more favorable.

[18] Coke is currently exempted from regulation pursuant to 49 U.S.C. 10502. *See,* 49 CFR 1039.11(a) (STCC No. 29-914); *Rail Exemption — Transp. of Selected Commodity Groups*, 9 I.C.C.2d 969, 978 (1993). Accordingly, UP has sought dismissal of the portion of this rate complaint that involves movements of coke. FMC has countered by seeking a partial revocation of the coke exemption as it applies to FMC's movements. As our predecessor, the Interstate Commerce Commission (ICC), explained in issuing the coke exemption (9 I.C.C.2d at 978), the exemption will be revoked where regulation is shown to be necessary. *See,* 49 U.S.C. 10502(d). That showing cannot be made here because, as discussed *infra*, we conclude that UP lacks market dominance over the coke movements at issue. Consequently, we could not review the reasonableness of the rates that applied to these coke movements even if we were to revoke the exemption. Therefore, we deny FMC's petition for partial revocation of the exemption.

concedes that there is no direct rail competition for these movements.[19] Thus, the only issue here is whether there is effective intermodal competition.[20]

Motor carriage is available for this traffic and FMC concedes that it has obtained trucking rate quotations that are comparable to UP's current rail rate. Moreover, FMC used trucks to transport coke in 1983, when 12% of the coke moved from Kemmerer to Don by truck. Indeed, UP has presented evidence to show that, from 1981 to 1992, rail contract rates declined, and other benefits were provided to FMC, in response to the threat of such competition.

FMC nonetheless offers several arguments as to why motor carriage should not be viewed as an effective competitive alternative for these rail movements. FMC relies on the fact that its plants at both Kemmerer and Don are configured for rail service. At the Don plant, FMC unloads the coke directly from the rail cars into its phosphorus production process. FMC argues that the costs of converting its facilities to accommodate large-scale trucking operations — which would include significant investment in additional roads, load-outs and nozzles, and an improved dust collection system at Kemmerer, as well as substantial investment in storage facilities,[21] a handling system, and environmental compliance at Don[22] — would make trucking significantly more expensive.

There are significant costs associated with whatever method FMC chooses to use to store coke, but there is no evidence that the storage costs related to motor transport would exceed those related to rail transport. FMC currently uses UP's open hopper cars for storage at Don, but UP notes that FMC could avoid

[19] *See,* UP Opening (Open.) Statement (Stmt.) at 35.

[20] UP presented evidence relating to geographic competition, but we do not consider that evidence. *See,* n. 16, *supra.*

[21] FMC states that it must store coke to account for surges in demand and because the Kemmerer plant shuts down for maintenance (for 8-9 days at a time) three times a year.

[22] FMC Open. Verified Statement (V.S.) Abbott, Exhibit (Exh.) 9,10.

approximately $1 million per year in demurrage charges[23] by using off-site storage in open hopper truck trailers at Kemmerer or elsewhere en route.

Demurrage savings would be roughly comparable to the amortized cost of the new facility that FMC claims would be needed to transport by truck, which would include ample storage.[24] Moreover, FMC's proposed dome storage facility would provide additional benefits that go well beyond what is required for a shift from rail to trucks. The facility — which accounts for most of the additional investment FMC claims would be required if it were to shift its coke movements to trucks, and would be usable both by rail cars and trucks — would permit FMC to improve the production method currently used at Don regardless of what mode FMC uses to transport coke. Further, a dust-free unloading system would aid FMC in control of particulate matter (airborne dust).[25]

FMC argues that total reliance on motor carriage to move all of the coke traffic at issue would involve 5,000-6,000 truck deliveries a year, thereby increasing traffic and dust in the area. As UP notes, however, even if all of the coke traffic at issue were diverted to motor carriage, this would result in an increase in traffic of only about 15 trucks per day.[26] UP has also explained that it takes several days (and four local trains) to meet unexpected surges in demand for coke by rail, and that use of truck deliveries, which are prompter, would lessen the need for reserves of coke to be stored on site to meet any such unexpected surges in demand.

We conclude that the potential for conversion to motor carriage is sufficient to discipline UP's rail rates. Indeed, the record shows that FMC has used the

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[23] Demurrage charges compensate railroads for the use of their railcars and act as a deterrent to shippers holding cars longer than necessary before returning them to the rail system. Typically, the longer a car is held, the higher the charges that accrue.

UP asserts that FMC has incurred $1 million per year in demurrage charges for this traffic since the rail transportation contract covering this traffic expired. FMC has refused to pay these demurrage charges and UP has sued to collect them. The court has referred to us issues relating to when the carrier could begin to impose those charges, in view of the notice requirements contained in 49 U.S.C. 11101 and 49 CFR 1300. *Union Pac. R.R. v. FMC Corp.*, No. 99-CV-200 (E.D. Pa. Feb. 3, 2000). However, the carrier's ability to impose such charges, once any notification requirement was met, does not appear to be at issue in that case. Thus, regardless of the outcome of that litigation, FMC will incur substantial demurrage costs if it continues to use UP railcars for storage.

[24] Here, as elsewhere in this decision, precise numbers are omitted where possible to protect confidential information submitted to us under seal.

[25] Pocatello is within a region listed by the United States Environmental Protection Agency as a "non-attainment area" for particulate matter.

[26] Another nearby industry, Monsanto/Solutia, transports coke similar distances over many of the same roads.

threat of switching to trucks credibly in the past to obtain rate reductions.[27] Accordingly, we are persuaded that the continued threat of a potential conversion to truck provides an effective constraint on UP's rail rates.

FMC suggests that, if it were to switch to trucking, it would be subjected to retaliation on movements of other commodities that remain captive to UP. This argument assumes that UP is now charging less than it could on some segment of captive FMC traffic, and would increase those rates if FMC were to switch its coke movements to truck. We have been given no reason to believe, however, that UP is not now maximizing its returns (to the extent permitted under constrained market pricing principles) on its captive movements of other commodities.

2. Phosphate Rock

FMC's plant at Don also processes 1.4 to 1.5 million tons of phosphate rock (shale) per year to produce elemental phosphorus. Since 1994, all shipments of this commodity have originated at FMC's mine at Dry Valley, ID, approximately 90 miles from the plant. UP, which transports the phosphate rock in 84 to 86-car unit trains is the only rail carrier at both the plant and the mine. Although there are no rail alternatives for this traffic, UP contends there is potential competition from trucks and pipeline constraining its rates.

a. Truck Alternative

FMC investigated the feasibility of using motor service when planning the opening of the Dry Valley mine. A motor carrier that it contacted offered a preliminary rate quote that was substantially above the current rail rate. FMC thus concluded that there was little reason to pursue a trucking option.[28]

UP points out that another chemical producer (Solutia) uses its own trucks to deliver phosphate rock to its plant. However, Solutia's source of shale is only 15 miles from its plant, and its trucks traverse a private road. The private right-

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[27] This finding is supported by the confidential memorandum at UP Reply, Volume (Vol.) 8, tab 37.

[28] While UP argues that the quote from the motor carrier was only a "first cut analysis" and that the carrier had suggested it could develop a lower rate, UP has not shown that significantly lower motor carrier rates could be obtained. In any event, conversion to trucks now would require additional investment in facilities, the costs of which have not been provided in the record but would have to be considered in determining how much lower the truck rate would need to be in order to provide an effective competitive alternative.

of-way permits the use of double- and triple-trailers, which are capable of carrying over 200 tons per trip. In contrast, FMC's shipments would have to be carried 90 miles over public roads, limiting the permissible payload to 35 to 40 tons per truck. Thus, if FMC were to rely on motor carriage, it would require 40,000 to 50,000 truck shipments per year. Moreover, those shipments would have to be concentrated during the summer months because phosphate rock freezes in cold weather and cannot be loaded or unloaded in a frozen state. FMC claims that there would be significant safety and environmental concerns associated with this large concentration of truck movements. We agree and are satisfied that, in these circumstances, trucking is not a competitive option.

b. Pipeline Alternative

Prior to the opening of the Dry Valley mine, FMC also examined the possibility of transporting phosphate rock by pipeline, but determined that there were significant technical difficulties associated with processing the product for pipeline transport.[29] FMC evidently considered using the same trench as another nearby company (J.R. Simplot) that has a phosphate slurry pipeline. However, the slurry from a pipeline is inappropriate for the thermal process that FMC uses to produce elemental phosphorus. The slurry coming out of the pipeline would first need to be reprocessed to remove moisture. Moreover, the slurry removes natural clays from the ore that are beneficial in the thermal process.

Even if these processing problems could be overcome, FMC notes that it could face significant obstacles in obtaining the necessary right-of-way, environmental permits, and construction approvals for a new pipeline. In any event, the costs of constructing and operating a 90-mile pipeline would significantly exceed FMC's current rail costs.[30] Accordingly, we do not find that the potential for pipeline transportation represents an effective competitive alternative.

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[29] UP maintains that FMC nonetheless used the threat of pipeline construction successfully in contract negotiations with the railroad, pointing to rate concessions that UP made during contract negotiations in 1988-89. FMC, however, cites a confidential UP memorandum indicating that UP knew that FMC would face serious obstacles and substantial investment in shifting to pipeline transport. *See,* FMC Rebuttal (Reb.) Argument (Arg.) at 34-36, Exh. 1. Thus, it appears that UP did not take the pipeline threat seriously.

[30] *See,* FMC Reb. V.S. Abbott, Exh. 1.

3. Phosphorus

UP transports elemental phosphorus from Don, ID to FMC facilities at Lawrence, KS, Westvaco, WY, and to Chicago gateways for interline movements to Nitro, WV, and Carteret, NJ. Phosphorus is a hazardous material that spontaneously oxidizes when exposed to air. It is shipped under a water blanket in tank cars. Water used to blanket the phosphorus is transported in both the loaded and empty direction. UP concedes that there is no intra- or intermodal competition for these shipments.[31]

4. Soda Ash

FMC shipped approximately 2.2 million tons of soda ash in 1998, of which 85% moved in bulk over UP. FMC challenges UP's soda ash rates on local- and proportional-rate movements from FMC's plant at Westvaco, WY to various points in Illinois (at Chicago, Irondale, Clearing and Galt), Kansas (at Lawrence), Missouri (at Kansas City) and Oregon (at Portland). As explained below, even though some soda ash moves by truck or in truck/rail transload movements, we find that there is not effective competition for the movements at issue here.

a. Truck Alternative

FMC ships less than 1% of its soda ash in bulk by truck,[32] because truck rates are substantially higher than rail rates.[33] What moves by trucks does so because the receivers either do not have access to rail service or choose not to invest in the storage facilities necessary to receive soda ash by railcar. Accordingly, we conclude that UP does not face effective competition from trucks for the traffic at issue.

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[31] UP presented evidence relating to geographic competition, but, as noted above (n. 16), we do not consider that evidence. We note, however, that FMC provided a quote from UP's confidential "Phosphorus Strategic Plan, 1996-1998" wherein UP acknowledged that it has substantial market power in this market. *See,* FMC Open. Stmt., Vol. 1, Exh. 1.

[32] The percentage of soda ash moving by each mode is set forth in FMC Open. V.S. Abbott, Exh. 14. Transporting bagged soda ash is even more costly and does not provide a competitive alternative.

[33] FMC Open. V.S. Abbott, Exh. 18.

b. Transload Alternative

Another transportation option available to FMC for this traffic is to truck its shipments to locations where they can be transloaded onto rail cars for movement by Burlington Northern and Santa Fe Railway Company (BNSF) to the same gateways used by UP. BNSF has such transload facilities at Bonneville, WY (180 miles from Green River) and at Ogden and Salt Lake City, UT (each about 160 miles from Green River). However, BNSF's transload service has only garnered a small percentage of FMC's soda ash traffic,[34] and the capacity of the transload facilities is limited.[35]

According to UP, FMC has cited this competitive alternative in its negotiations with UP and has previously threatened to contract with BNSF for a second transload facility at Bonneville at which FMC would be the major customer. UP argues that it is only because of UP's competitive responses to this threat that BNSF has not expanded capacity at these transload points. UP claims that the continuing competitive pressure provided by this alternative constrains its rates.

We are not persuaded that the transload alternative provides an effective competitive restraint because the transload option operates at a large cost disadvantage.[36] The total costs for using the transload operation include the cost of trucking shipments to the transload facility, the cost of performing the transloading, and, if the shipments are transloaded at one of the Utah points, the trackage rights fees that BNSF must incur to provide rail service from that point. Moreover, BNSF does not have a shorter rail route to the gateways that would allow it to offset the other costs with a cost-saving on the rail portion of the movement.

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[34] While rail shipments of soda ash from the Green River area have increased from 6.9 million tons in 1990 to 8.3 million tons in 1997, the transload share of the soda ash market dropped from a peak of almost 21% to less than 12% of total Green River production. *See,* UP Reply V.S. Spero, Exh. RDS-3.

[35] The Bonneville facility currently can handle approximately one million tons a year, while the Utah facilities combined can handle 700,000 tons annually.

[36] FMC states that because of this large disadvantage, BNSF has stated that it will not expand the Bonneville transload operation.

We conclude that the fact that UP matches prices set by alternatives with significantly higher costs,[37] while maintaining a dominant market share, is not enough to demonstrate effective competition for the traffic at issue.[38]

c. Statements by FMC

Our conclusions here are not altered by statements made by FMC officials over the past five years — in rate negotiations with UP, in internal FMC memoranda, and in a verified statement submitted to us in the UP/SP merger proceeding — indicating that UP's soda ash transportation is "competitive." Statements made to UP in the course of rate negotiations can only be regarded as posturing in aid of FMC's negotiation position.

The internal memoranda (presumably prepared in support of those same negotiations) are not necessarily inconsistent with FMC's position here. The transload alternative does impose an outer limit on the rate that UP can charge, although UP can exercise considerable market power before reaching that outer limit. In other words, there is a competitive constraint, even though there is not effective competition.[39]

As for the statements made in the UP/SP merger proceeding, the primary focus there was on whether UP's merger with SP would increase UP's market power, not on the existing level of UP's market power. Moreover, the soda ash rates that FMC described as "competitive" and "reasonable" were the contract rates that were in place at that time. When those rates were replaced with common carriage rates (after further contract negotiations broke down), FMC lost many of the important benefits that its contract had afforded. Thus, FMC's statements in that proceeding are not inconsistent with its position here.

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[37] *See,* FMC Open. V.S. Abbott, Exh. 16.

[38] UP has submitted econometric evidence attempting to show that this traffic is sufficiently price-sensitive to preclude a finding of market dominance. UP reasons that, where the demand for transportation is elastic, it cannot successfully exert market power. We disagree. Economic theory tells us that a monopolist will raise its rates to the point that it is no longer profitable to do so. Thus, the econometric evidence merely suggests that it would not be profitable for UP to raise its rates further. It does not show whether or not UP has market dominance, just as it does not show whether or not the current rate levels are reasonable.

[39] *See, Arizona Pub. Serv. Co. v. United States,* 742 F.2d 644, 650-51 (D.C. Cir. 1984).

5. Sodium Bicarbonate and Sesquicarbonate

The challenged rates for sodium bi- and sesquicarbonate[40] apply to movements from Westvaco, WY to the Chicago gateway and to FMC's distribution and repackaging facility at Irondale, IL. Of the approximately 56,600 tons of bicarbonate and 68,000 tons of sesquicarbonate that FMC shipped from its Westvaco facility in 1998, only about 20,000 tons moved under the challenged rate.[41] FMC evidently uses trucks for a significant number of the other shipments,[42] even though it is much more expensive to use trucks.[43] As FMC has explained, some of its customers do not have access to rail, while others do not receive a sufficient volume to make it economical for them to invest in the storage and other facilities necessary to receive these products by railcar. (In other words, for some customers, a truckload shipment is sufficient, but a railcar would be too much.) Given the substantial rate disparity between the two modes, we are satisfied that trucking is not an effective competitive alternative for those shipments that can be received by rail.

UP is the only railroad that provides direct service from Westvaco. As with soda ash, these compounds could be trucked to the Bonneville transloading facility for rail movement via BNSF.[44] Even though UP has made some rate concessions on this traffic,[45] the transloading option does not provide effective competition in view of the additional costs for the truck portion of the move and

[40] Sodium bicarbonate is used for cleaning, deodorizing, leavening, softening, degreasing and buffering. It is used in food (32%), animal feed (24%), cleaning products (9%), pharmaceuticals and personal care (9%), chemicals (8%), water treatment (6%), fire extinguishers (2%), paint blast media (2%) and miscellaneous other products (8%).

Sodium sesquicarbonate is a combination of soda ash and sodium bicarbonate. Its primary use is as a rumen buffer in cattle feeds. It is also used in detergents and bath salts.

[41] UP's rates do not distinguish between bi- and sesquicarbonate. The parties' variable cost evidence indicates that UP moved 59 carloads (5,500 tons) to Irondale and 149 carloads (14,300 tons) to Chicago.

[42] *See,* UP Reply, Vol. 8, tabs 70, 77, 108.

[43] *See,* FMC Open. V.S. Abbott, Exh. 18 (showing the truck rates available to FMC to Chicago and Irondale. Bold type indicates the truck rates that were used in 1998, which appear to be applicable both to soda ash and to sodium bi- and sesquicarbonates).

[44] The Bonneville facility handles bulk soda ash in five producer-dedicated silos.

[45] UP claims that FMC successfully used the threat of truck competition to lower its rail contract rate with UP prior to the contract's expiration in 1997. According to UP, the Chicago rate was lowered twice, while a single reduction was made on the Irondale rate. UP submitted a 1995 FMC interoffice memo showing that BNSF undercut UP's rate to Chicago for sodium sesquicarbonate destined to a particular customer. *See,* UP Reply, Vol. 8, Tab 51.

the transloading service itself.[46] Moreover, at least one receiver has expressed concern about product integrity when these commodities are transferred.

Accordingly, on this record we find that UP faces no effective competition from truck or BNSF transloads for its movements of sodium bicarbonate and sodium sesquicarbonate to Irondale or Chicago.

III. RATE REASONABLENESS STANDARDS

A. Constrained Market Pricing

Our general standards for judging the reasonableness of rail freight rates are set forth in *Coal Rate Guidelines, Nationwide*, 1 I.C.C.2d 520 (1985) (*Coal Rate Guidelines*), *aff'd sub nom. Consolidated Rail Corp. v. United States,* 812 F.2d 1444 (3d Cir. 1987). Those guidelines impose a set of pricing principles known as "constrained market pricing" (CMP).[47] They contain three main constraints[48] on the extent to which a railroad may charge differentially higher rates on captive

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[46] To maintain product integrity, separate (dedicated) silos are used for transload movements of soda ash. However, there are not sufficient volumes of sodium bicarbonate and sodium sesquicarbonate to warrant the investment in dedicated silos. The process of transferring bicarbonate and sesquicarbonate directly from trucks to rail cars would make transloading these commodities even more costly than the soda ash transloads, which we have found do not provide effective competition for UP's movement of that commodity.

[47] The objectives of CMP can be simply stated. A captive shipper should not be required to pay more than is necessary for the carrier(s) involved to earn adequate revenues. Nor should it pay more than is necessary for efficient service. A captive shipper should not bear the cost of any facilities or services from which it derives no benefit. Responsibility for payment for facilities or services which are shared by other shippers should be apportioned according to the demand elasticities of the various shippers. *Coal Rate Guidelines Nationwide*, 1 I.C.C.2d at 523-524.

[48] A fourth constraint — phasing — can be used to limit the introduction of otherwise-permissible rate increases if they would lead to undue inflation and dislocation of important economic resources. *Id.* at 546-47.

traffic: revenue adequacy;[49] management efficiency;[50] and stand-alone cost (SAC).[51]

The revenue adequacy and management efficiency constraints employ a "top-down" approach, examining the incumbent carrier's existing operations. If the carrier is revenue adequate (earning sufficient funds to cover its costs and provide a fair return on its investment), or would be revenue adequate after eliminating unnecessary costs from specifically identified inefficiencies in its operations, a complaining shipper may be entitled to rate relief. The SAC constraint uses a "bottom-up" approach, calculating the revenue requirements that a hypothetical new, optimally efficient carrier would need to meet for providing rail service to the complaining shipper. FMC has chosen to proceed here using a SAC analysis.

B. SAC Test

A SAC analysis seeks to determine the lowest cost at which a hypothetical, optimally efficient carrier could provide the service at issue free from any costs associated with inefficiencies or cross-subsidization of other traffic. A stand-alone railroad (SARR) is hypothesized that could serve the traffic if the rail industry were free of barriers to entry or exit. (It is such barriers which can enable railroads to earn monopoly profits.) Under the SAC constraint, the rates at issue cannot be higher than what the SARR would need to charge to serve the complaining shipper while fully covering all of its costs, including a reasonable return.

To make a SAC presentation, a shipper designs an SARR specifically tailored to serve an identified traffic group using the optimum physical plant or

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[49] The revenue adequacy constraint ensures that a captive shipper will "not be required to continue to pay differentially higher rates than other shippers when some or all of that differential is no longer necessary to ensure a financially sound carrier capable of meeting its current and future service needs." *Id.* at 535-36.

[50] The management efficiency constraint protects captive shippers from paying for avoidable inefficiencies that are shown to increase a railroad's revenue need to a point where the shipper's rate is affected. The management efficiency constraint focuses on both short-run and long-run efficiency. *Id.* at 537-42.

[51] The SAC constraint measures efficiency, ensures that the captive shipper does not cross-subsidize other traffic, and protects the shipper from having to pay more than the revenue needed to replicate rail service in the absence of barriers to entry and exit. *Id.* at 542-46.

rail system needed for that traffic.[52] Based on the traffic group, services provided and terrain traversed, a detailed operating plan must be developed to define further the physical plant that would be needed for the SARR.[53] The operating plan is a prime determinant of the total investment needed and annual operating costs that would be incurred by the SARR. It is assumed that investments would be made prior to the start of service and recovery of that investment would occur over the economic life of the assets.[54] We use a computerized discounted cash flow (DCF) model to simulate how the SARR would expect to recover its investments after taking into account inflation, Federal and State tax liabilities, and a reasonable rate of return (its cost of capital). The annual revenue required to recover the SARR's investment cost is then combined with the annual operating cost to calculate the total annual revenue requirements.

We then compare the revenue requirements of the SARR to the revenues that it could expect to receive from the traffic group that it would serve. Absent better evidence, we presume that the initial revenue contribution from non-issue traffic would be the actual revenues generated by the base year movements of each component of the stand-alone traffic group.[55] Forecasted (future) traffic and rate levels for that traffic group determine future revenue contributions.

By comparing the total costs of the stand-alone system to the total revenues that would be available to the SARR over the period of analysis (usually a 20-year period), we determine whether there would be over- or under-recovery of costs. Because the analysis period is lengthy, we use a present value analysis that takes into account the time value of money, netting annual over-recovery and under-recovery as of a common point in time.

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[52] Parties use computer models to simulate the flow of traffic over the defendant's rail system. This computer simulation permits the complainant to specify the traffic group and route system of the SARR. The simulation of traffic flows permits a complainant to select a route system which would have sufficient economies of density to maximize revenue contribution while minimizing the total costs of the stand-alone carrier.

[53] For example, roadway must be sufficient to permit the attainment of the speeds and density that are presumed. The length and frequency of passing sidings must be able to accommodate the specific train lengths and frequency of train meets that are assumed, and traffic control devices must be designed to allow trains traveling in opposite directions on the same track to be handled safely and efficiently based on the density assumed in the operating plan.

[54] Our SAC analyses are limited to finite periods of time (here, 20 years), but parties provide for sufficient investment to enable the SARR to operate into the indefinite future. We estimate the economic value of the SARR's assets at the end of the analysis period by computing the present value of a perpetual stream of earnings at the revenue requirement in the last period of the analysis.

[55] *Coal Rate Guidelines Nationwide*, 1 I.C.C.2d at 544.

If the sum of the present value of over-recoveries exceeds the under-recoveries, we can conclude that the existing rate levels are too high. We must then determine the extent to which the revenues of the traffic group should be reduced so that, over the 20-year analysis period, there would be no net over- or under-recovery. Absent better evidence, we assume that any over-recovery should be distributed among the traffic in the group using an identical percentage reduction to all rates. In that way, we can determine the rate that the SARR would need to charge to the complainant, and hence the maximum reasonable rate that the complainant should pay the defendant carrier for equivalent service. *See generally, West Texas; Arizona Public Service Co. v. Atchison, T.&SF. Ry. Co.*, 2 S.T.B. 367 (1997) (*Arizona I*).

IV. ORR STAND-ALONE COST ANALYSIS

A. Preliminary Note

In SAC cases, the complaining shipper has the responsibility for designing the stand-alone railroad and has the initial burden of supporting the feasibility of all components of its design and cost estimates. *Coal Rate Guidelines*, 1 I.C.C.2d at 544. On numerous issues in this case, FMC provided no support for the assumptions or figures in its opening evidence. Where challenged and countered by other evidence, we can accord no weight to such unsupported evidence. Thus, in those instances, we have applied a rebuttable presumption that UP's alternative evidence is the better evidence of record. We have adjusted UP's evidence, however, where FMC on rebuttal demonstrated that UP's evidence is itself overstated or inaccurate.

In addition, we note that both parties in this case often did a poor job of referencing the workpapers and electronic files that supported their verified statements and arguments. In many instances, only by wading through a maze of workpapers and electronic files was our staff able to discern whether there was any basis to accept a party's particular position.[56] The consultants representing the parties here, and others that may prepare evidence in the future, are cautioned that in future cases we do not intend to search through reams of unreferenced

[56] Often without any reference, the parties depended on their workpapers and electronic files as the sole explanation for their position on certain issues. For example, in its opening evidence FMC's entire explanation of its operating plan consisted of one small, less-than-enlightening paragraph contained in FMC's witness Stern's opening statement. FMC apparently intended for the Board and UP to wade through its numerous workpapers and electronic files, without references as to location, to decipher the particulars of its operating plan.

materials in an effort to determine the parties' positions or to ascertain whether the positions espoused in the record have support. The statute requires that we resolve a rate complaint that is based on a SAC presentation within nine months of the close of the administrative record.[57] The exhaustive review of unreferenced workpapers and electronic files made compliance with the statutory directive extremely difficult in this proceeding. In future proceedings, any support in workpapers or electronic files on which a party intends to rely must be specifically and clearly referenced in the evidence to avoid a presumption that no support exists for the particular position espoused. General references to workpapers or electronic files will not be sufficient to overcome the presumption.

B. Configuration

FMC developed a hypothetical stand-alone railroad called the Overland Railroad (ORR), which would replicate approximately 3,000 miles of the UP rail system. The ORR would extend from Portland, OR to Chicago, IL and Kansas City, MO, with a 375-mile extension into the Powder River Basin (PRB) coal fields. Because the ORR would not replicate the entire UP system, some traffic that is now served by UP would be "crossover" traffic for the ORR—traffic that would (hypothetically) move in interline UP/ORR service. For a map and a more detailed description of the ORR configuration, see, Appendix B.

In general the parties agreed on the route the ORR would follow and the points the ORR would reach. However, as discussed in Appendix B, FMC would have the ORR lines terminate in Kansas City, KS, even though some of the soda ash traffic covered by the complaint is currently delivered to Kansas City, MO. As we have noted in prior cases,[58] an SARR must either be designed to provide complete service to all the traffic at issue or include the costs of providing any additional or substitute service that would be needed to complete the transportation covered by the challenged rate. Therefore, we include the costs for the ORR to extend its lines to Kansas City, MO, as FMC did not include the costs that would be associated with delivery of FMC's soda ash to Missouri. We also reject FMC's proposed yard designs for the ORR (and use UP's larger yard designs) because FMC provided no creditable evidence to support its proposal. These and other, more minor disagreements among the parties as to the exact configuration of the ORR are discussed in Appendix B.

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[57] 49 U.S.C. 10704(c)(1).

[58] *McCarty Farms, et al. v. Burlington Northern, Inc.*, 2 S.T.B. 460, 468 (1997) (*McCarty*).

C. Traffic Group

The traffic selected by FMC to be served by the ORR consists of 6 specific commodity groups (coal,[59] field crops, TOFC/COFC,[60] soda ash, phosphate rock, and motor vehicles) and a general freight group. The parties use 1997 traffic levels as the base-year volumes (a total of about 200 million tons),[61] but disagree on the level of the revenues that the ORR could expect to receive from that traffic in 1997 and on the likely growth in volumes and revenues over the 20-year SAC analysis period. These issues are discussed below.[62]

1. Base-Year Revenues

For movements where the ORR's lines would replicate all of the UP's lines used to provide the transportation, the parties assume that the ORR revenues would be the same as UP's revenues on that traffic. However, as noted above, the ORR would not replicate the entire UP system, and thus some shipments in the ORR's traffic group would have to be interchanged with what would remain of UP in order to complete the transportation. For such crossover traffic, the revenues would need to be divided between UP and ORR.

FMC used the same (modified mileage prorate) method that has been used in prior SAC cases to estimate the revenues that the SARR would earn from a

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[59] The coal traffic would constitute 67% of the ORR's annual tonnage and approximately 42% of the ORR's annual revenue.

[60] Trailer-on-flat-car/container-on-flat-car traffic refers to the rail movement of truck trailers (TOFC) or shipping containers (COFC) on a rail flat car as part of an intermodal movement.

[61] When the evidentiary submissions for this proceeding were prepared, actual UP traffic data were available only for the first nine months of 1997. The parties estimate full base-year volumes by indexing full-year 1996 figures by the percent change between the first nine months of 1996 and the comparable 9-month period of 1997. *See,* FMC Reb. V.S. Burris at 38.

[62] On November 24, 1999, UP requested that we reopen the record for receipt of a tendered study prepared by FMC's economic consultant, L.E. Peabody & Associates (LEPA), for the Alliance for Rail Competition (ARC). That report contained volume and rate projections for all Class I railroads for the period 1998-2005. Those projections are substantially lower than the projections used for the same years in this proceeding. UP contends that the projections in the ARC study are more representative of what the ORR could expect, and tenders the ARC report to impeach the credibility of LEPA's traffic projections here.

FMC, in a reply filed December 8, 1999, pointed out that the ARC study was not specific to the traffic in the ORR traffic group, but covered all traffic carried by all Class I railroads. FMC submits that the projections in the ARC study would have been higher if the internal UP data had been available to LEPA. We agree with FMC that UP's new evidence does not bear directly on the ORR traffic. Therefore, we deny UP's untimely request to reopen the record.

crossover movement.[63] FMC argues that, without specific information on UP's division of total shipment revenue on UP's actual joint-line movements, it is unable to develop an algorithm to generate more realistic, market-based revenue divisions for crossover movements.[64]

UP raises several objections to FMC's revenue calculations. UP argues that FMC failed to reflect a $2.7 million "negative revenue" adjustment which UP asserts is needed to reflect rebates or refunds to shippers. UP further argues that FMC has overstated ORR's revenues for those crossover movements where ORR/UP joint-line service (that would replace current UP single-line service) would be in direct competition with BNSF single-line service. Finally, UP argues that use of the modified mileage prorate overstates the market-based division that the ORR could expect in two situations: (a) where UP would be the terminating "bottleneck" carrier for certain coal movements, and thus would be able to capture the bulk of the available economic rents; and (b) where UP, as the originating or terminating carrier, would have a short-haul and thus could expect to receive a higher share of the revenues than suggested by the modified mileage prorate method.

a. Allowances and Rebates

UP states that, in preparing traffic tapes for FMC's use, it attempted to adjust shipment revenues to reflect all allowances and rebates paid to shippers, but that an additional $2.7 million revenue adjustment is now required to reflect additional allowances and rebates beyond those previously reflected. FMC argues that no additional revenue adjustments are appropriate. FMC identifies

[63] Under the modified mileage block prorate method, a carrier obtains one mileage block of "credit" for each 100 miles (or portion thereof) that it handles the shipment (*e.g.*, a railroad handling a shipment 101 or 199 miles would get two blocks credit). Originating and terminating carriers get credit for an additional block to cover the added cost associated with originating and terminating traffic. Total blocks for any movement are divided into total revenue to develop a revenue per block, which is then multiplied by each carrier's block count to develop its share of revenues. This is the best procedure for allocating revenues to carriers where market-based divisions are not available. *See, McCarty* at 471; *Bituminous Coal–Hiawatha, UT to Moapa, NV,* 10 I.C.C.2d 259, 268 (1994) (*Nevada Power II*).

[64] In discovery, FMC requested information on the total revenues earned on multiple-carrier movements, as well as UP's share of those revenues. *See,* Items r and t of Interrogatory No. 36 of FMC's First Set of Discovery Requests (included as an attachment to the complaint). However, UP provided information only on its share of the revenues. Without information on total actual revenues, FMC was unable to determine the percentage share of revenues typically earned by UP in various situations.

two instances where the additional adjustments would result in negative revenues for certain movements, which is clearly unrealistic. FMC also identifies an adjustment for a movement not even included in the ORR traffic group. (These three specific examples account for approximately $440,000 of the $2.7 million in adjustments that UP contends are needed.) We find that other of the adjustments are also questionable.[65] Accordingly, we conclude that the additional adjustments are sufficiently unreliable that it would be inappropriate to include them.

b. Joint-Line Versus Single-Line Service

UP contends that much of the ORR's traffic base (47% of the ORR's traffic volume and 40% of its revenue) would consist of ORR/UP interline service that would have to compete with existing BNSF single-line service. UP argues that joint-line operations would not be as well coordinated or efficient as single-line hauls, thus placing the joint-line service at a competitive disadvantage that would ordinarily be expected to reduce the market share for the joint-line service. Accordingly, UP argues that the ORR/UP rates (and corresponding revenues) for these movements would need to be reduced by 5% to prevent market-share erosion.[66] (UP's proposed 5% discount would reduce base year revenues by $53 million.)

FMC claims that a 5% revenue adjustment is arbitrary and inappropriate. FMC argues that joint-line hauls have become highly efficient, with carriers using run-through power on a regular basis to streamline these movements and to remain competitive with single-line service. FMC further argues that single-line movements enjoy a significant advantage over joint-line movements only for time critical services, and FMC states that a large portion of ORR's traffic is not

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[65] For example, UP included a movement from Reisor, LA to Kent, WA that shows positive revenues of $345,361 on at least one occasion and negative revenues of $372,455 on at least another occasion. There are also several questionable entries for general freight, such as one from Fife, WA to Evans, CO, showing both positive revenues of $17,767 and, on at least one different occasion, negative revenues of $47,513.

[66] UP cites only two examples where joint-line rates are set at levels significantly below rates set by single-line competitors. In the Chicago-Dallas intermodal market, the interline service offered by Illinois Central Railroad Company (IC) in combination with Kansas City Southern Railway Company (KCS) and by I&M Rail Link, LLC (IMRL) in combination with KCS offer $625 rates in competition against UP's single-line $750 rate, a 17% discount. Before SP gained access to Chicago, its interline rates on intermodal transcontinental traffic, using an interchange with BNSF at Denver, reflected a similar discount.

time sensitive. It claims that shippers of bulk commodities are more concerned with consistency of service than transit times.

We agree that the ORR/UP service proposed here would provide a level of service remarkably similar to that provided by UP in single-line service today. Under the operating plan that we use, the ORR/UP interchanges generally would entail crew changes at the same points that UP's single-line crew changes now occur, and with no regrouping of cars in rail yards — which causes lower service levels for many interline movements — beyond that already performed by UP. Thus, even for time-sensitive traffic, we reject UP's proposed revenue adjustment.[67]

c. Movements Where UP Would Be "Bottleneck" Destination Carrier

UP contends that, for crossover movements on which UP exclusively serves the destinations, the ORR would only be able to obtain a small markup (20%) over its variable cost because UP would garner the remaining revenue. Accordingly, UP argues that the ORR revenue estimates should be reduced to 120% of variable cost for 6 coal movements out of the PRB (thus reducing the ORR base-year revenue estimates by $42 million).[68]

UP has provided scant evidence, however, to show that its proposed 120% R/VC figure provides a better approximation of market-based divisions.[69] Moreover, as discussed above, in withholding from FMC division information for all UP movements, UP denied FMC the opportunity to produce an alternative algorithm that might be more suitable for estimating market-based divisions for these movements. Thus, in the absence of any better evidence, we use FMC's modified mileage prorate method to estimate ORR divisions for these movements.

[67] To the extent that joint-line service would result in any additional costs, these costs have properly been included in the SAC calculation.

[68] *See,* UP Reply V.S. Peterson, Exh. RBP-3.

[69] UP's only evidence to support this figure consists of R/VC calculations for the UP segments of three PRB coal movements where another carrier exclusively served the destination. *See,* UP Reply V.S. Peterson, Exh. RBF-2. UP offers no explanation of why these movements should be considered representative.

d. Short-Haul Divisions

UP also contends that the mileage block prorate method understates the divisions that would be expected by interline carriers that originate or terminate traffic with hauls shorter than 200 miles.[70] It argues that short originating and terminating movements have higher relative costs and tend to receive a higher division than the modified mileage block method would accord. UP contends that "standard division" sheets — developed by railroads for use when there is no specific agreement between the carriers — should be used to estimate divisions in such short-haul situations. Based on limited examples, UP suggests that these standard division sheets would provide the railroad performing terminal short-haul service a larger share of revenues than would be provided by the modified mileage prorate method. Because standard divisions must be determined manually, UP did not adjust all short-haul movements, but only large-volume movements. (These adjustments would reduce ORR base-year revenues by $31 million.)

FMC argues that UP's refusal to produce actual division information during discovery should preclude UP's use of standard divisions here. FMC points out that, had UP produced the requested actual divisions information, FMC could have developed better divisions estimates not just for movements of less than 200 miles, but for all movements, and that such an approach may have increased ORR revenues in certain circumstances. FMC also objects to UP's selective application of standard divisions to only those situations where on the whole UP would benefit. FMC contends that the ORR would have over 22,000 carloads of base-year traffic on which the ORR was the short-haul carrier and on which UP made no adjustments.

While division sheets may provide some useful information on divisions between carriers, they are not as instructive as UP's actual divisions of total movement revenue.[71] Moreover, we agree that UP's use of division sheets for only certain traffic detracts from the probative value of this evidence. It is inappropriate for UP to deny FMC access to actual division data and then to rely on division sheets to rebut the modified mileage block prorate method for only

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[70] UP cites as examples the Seattle-Chicago movements (where UP would have a haul of only 183 miles out of a 2,418-mile total) and Denver-Chicago movements (where UP would have a haul of only 99 miles out of a 1,079-mile total).

[71] UP acknowledges that division sheets are only applicable in the (relatively infrequent) situation where the carriers have not made specific arrangements.

selected traffic. Consequently, we adhere to the use of the modified mileage prorate method here.

2. ORR Revenues Beyond the Base Year

To develop ORR revenue projections beyond the 1997 base year (and through the end of the 20-year DCF period), FMC and UP forecasted annual volume and rate changes for each of the seven categories of traffic in the ORR traffic group. We discuss below these volume and rate forecasts.

a. Traffic Volumes Generally

To estimate the volume of traffic (other than soda ash)[72] that the ORR would handle during the first four or five years of operation, FMC relied on UP's 1996 and 1997 "long range plans" (LRPs)[73] containing UP's forecasts of volume growth through 2001 or 2002, depending on the commodity. To estimate traffic growth beyond 2001 (or 2002), for traffic other than coal[74] and soda ash, FMC used the average (geometric mean) of the annual percentage change in traffic volumes contained in the LRPs from 1997 to that time.

UP argues that downward adjustments to its own projections are necessary because the LRPs are "aspirational" targets that assume that UP will invest in better service and price aggressively to capture new business.[75] UP argues that these targets would not likely be achieved by the ORR because FMC assumes that the ORR would have level service and steadily increasing rates (in contrast to UP's history of declining rates). UP further argues that the LRPs overstate likely growth by failing to factor in traffic declines that could be caused by recessions, floods, foreign economic crises (which could dramatically reduce demand for key products, such as grain), or events such as the recently ended

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[72] As discussed separately *infra*, FMC made its own forecast of future traffic volume for soda ash for the entire 20-year DCF period.

[73] FMC explained that, in order to distinguish between central corridor movements by the SP and UP railroads prior to their merger, it was required to use pre-merger, route-specific information from the 1996 LRP to develop grain, TOFC/COFC and motor vehicle growth rates. FMC Open. V.S. Burris at 20.

[74] FMC's estimate of the growth in coal traffic beyond 2002 is discussed separately *infra*.

[75] Comparing the revenue projection contained in past LRPs to the actual revenues achieved through 1996, UP asserts that its previous LRPs overstated annual revenue growth by 5.79%. UP Reply V.S. Peterson at 24. UP also cites *Union Pac. R.R. v. State Tax Comm'n of Utah*, 716 F. Supp 543, 557 (D. Utah 1988), a property tax case where the court described UP's LRPs as useful "more for their inspirational value than for their prediction value."

western rail service crisis.[76] Accordingly, UP would subtract an arbitrary 1% from each year's projected commodity-specific annual volume increase.

We believe that UP's own forecasts, made in the normal course of business, provide an acceptable basis for developing growth projections for the ORR. As FMC points out, the incorporation into the LRPs of estimates of future Gross Domestic Product (GDP) and other economic indicators demonstrate an effort on UP's part to develop traffic projections that are realistically related to expected future levels of economic activity. Furthermore, UP's consideration of potential commodity flows by traffic lane, type of service, and, in some instances, individual shipper indicates that the LRPs are detailed planning tools used by UP to estimate future traffic. Indeed, as FMC points out, UP has used the LRPs as a basis for discussion with security analysts.

UP's reduction of the LRP volume forecasts by an arbitrary 1% each year has no meaningful support, as it is based solely upon an UP witness opinion rendered specifically for this litigation. Moreover, while UP's forecasts cannot anticipate all major setbacks that could occur, neither can they anticipate all major marketing opportunities that may arise.[77] Finally, it would be inappropriate for us to assume, as UP suggests, that the ORR would have less flexible operations than UP and would not be able to adjust future operations to capture new traffic that becomes available or shed traffic that becomes unprofitable.

We base our SAC analysis on the best projections that are available on the record. Here, we conclude that the LRPs provide the best evidence of future traffic growth, except as discussed below. Therefore, with the exception of soda ash and coal (which are discussed separately below), we use the traffic forecasts in the LRPs for the years 1997 through 2001 (or 2002, as applicable) and we use FMC's procedure for carrying those forecasts forward through 2017. We recognize, however, that these projections could prove to be overly optimistic. If a clear trend should develop that is inconsistent with these projections, we remain available to revisit and adjust, as necessary, our findings and actions here.[78]

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[76] UP claims that unforseen positive events are not as likely as negative ones, due to the overly optimistic manner in which the LRPs are produced.

[77] We find unpersuasive UP's argument that ORR would not be expected to market its services aggressively and therefore would not realize the growth forecast by the LRPs.

[78] *See, Arizona Public Service Co. v. Atchison, T.&SF. Ry. Co.*, 3 S.T.B. 70 (1998) (*Arizona II*), at 74-75 (discussing balance between interests of administrative finality and fairness).

b. Soda Ash Volumes

FMC provided its own projections of soda ash movements. For the domestic soda ash market, FMC assumed no growth. For the export market, FMC forecasted a decline in traffic in 1998 and 1999, followed by a 4% increase in 2000, an 11% annual increase for the period 2001-2003, a less than 1% decline in 2004, and an 8% annual increase from 2005-2017.

UP agrees that the export market would decline in 1998-1999 and then grow from 2000-2017. However, UP estimated an annual growth rate of only 6% during the 2001-2007 period, followed by an annual growth of 4.45% thereafter. UP based its soda ash export volume projections on the high correlation between the GDP of each importing country and the amount of soda ash imported. Because no estimates of GDP are available after 2007, UP used the compounded average growth rate from 1999 through 2007, adjusted for the business cycle of the soda ash-importing foreign economies, to develop its growth rate for soda ash for the period 2008-2017. UP supported its estimate by comparing it with the 5.25% actual growth rate for the 1988-1998 period to show that soda ash consumption generally declines as economies mature.

FMC's forecasts are unsupported, consisting of nothing more than several pages of handwritten numbers with no explanation as to their derivation.[79] In contrast, UP's forecasts are based on the correlation of past soda ash consumption to the historic GDPs of importing countries.[80] Accordingly, we use UP's estimates.

c. Coal Volumes Beyond 2002

To estimate growth in coal traffic beyond 2002, FMC used UP's coal traffic growth estimate for 2002 only (the last year in the LRP used by FMC) — a 2.97% increase — and assumed that the 2002 rate of growth would continue at a constant level throughout the next 15 years. UP argues that this is not a reasonable assumption.[81] UP cites as support the findings of the Department of

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[79] FMC Open. V.S. Burris, workpaper WP0250.

[80] FMC is silent regarding UP's forecast procedure.

[81] UP argues generally that, beginning in 2006, the power plants that ORR would serve will be operating at full capacity and will not be able to burn additional coal. It also argues that any new power plants that are brought on line would most likely be fueled by natural gas, thereby constraining the prospect that ORR coal traffic originating in the PRB would continue to increase at the same rate. FMC counters that many utilities are switching to PRB coal from more expensive (continued...)

Energy's Energy Information Agency (EIA) in *Annual Energy Outlook 1999 With Projection to 2020*, Dec. 1998 (*AEO 1999*). Without explaining how it derived a specific growth rate, UP contends that ORR's growth in shipments of PRB coal should be limited to 0.5% annually after 2006. As support for its estimate UP produced a letter from the consulting firm of Hill & Associates expressing its agreement with UP's estimate.[82] However, in the absence of any analysis by Hill & Associates, we can accord little weight to this letter.

FMC seeks to support its figure by pointing out that in *DM&E* we accepted a forecast of a very similar 2.96% annual increase in PRB production levels for the period 2005-2010.[83] Moreover, FMC notes that the figure it used here is more conservative (lower) than 1998 EIA forecast for the 2005-2010 period.

We do not believe it is reasonable to base on our decision on either party's forecast — neither of which relates to the full time period under consideration (2003-2017) — since there are official forecasts from EIA that are specific to the particular traffic and time period at issue here. Therefore, we use EIA's *AEO 1999* report — which yields an overall 1.78% growth rate for that period — as the most reliable information available to forecast coal traffic growth for the years 2003-2017.

d. General Freight Volumes

UP's LRPs contain five general traffic categories: agricultural products, automobiles and intermodal, chemicals, energy, and industrial products. Because these categories are broader than the specific commodity groups selected by FMC, they may contain traffic that was classified as general freight on the ORR. UP argues that FMC incorrectly assumed that all of the LRP classifications contained traffic that would be included in the ORR's general freight category. UP claims that the chemicals and industrial products categories contain most of the general freight traffic that would be transported by the ORR. Accordingly, UP developed a growth rate estimate for general freight based only on the

[81](...continued)
and/or higher sulfur content eastern coals. PRB coal also has a very favorable delivered cost per BTU (British thermal unit). Moreover, because of the low sulfur content of PRB coal, electric utilities are burning increasing amounts of PRB coal to achieve compliance with Phase II of the Clean Air Act Amendments of 1990.

[82] UP Reply V.S. Peterson, Exh. RBP-10.

[83] *See,* FMC Reb. V.S. Burris at 55, citing to our decision in *Dakota, MN & Eastern RR — Construction — Powder River Basin*, 3 S.T.B. 847 (1998) (*DM&E*).

projected annual growth rates of chemicals (exclusive of soda ash and phosphate) and industrial products.

FMC acknowledges that UP's automobile and intermodal traffic classifications would not contain any ORR general freight, and FMC adjusted its initial estimate by removing all automobiles and intermodal traffic from its general freight growth rate calculation. FMC points out, however, that certain traffic contained in UP's agricultural products classification (such as processed foods and non-field crop food products) and energy classification (such as petroleum coke) would be general freight on the ORR.

We agree with FMC that UP's approach is too limiting and that traffic such as processed foods and petroleum coke would be handled by the ORR. Thus, we use FMC's revised estimate as the better evidence of record.

3. Rate Forecasts

FMC forecasted changes in ORR rates for each of the seven categories of traffic in the ORR traffic group for 1998-2001 or 1998-2002 (depending on the commodity) based on the average annual change in revenue per shipment that was forecast in UP's LRPs. For subsequent time periods, FMC assumed that rates would increase at levels equivalent to the forecasted rate of change in the RCAF-U.[84]

UP provided charts to show that the company-wide revenue forecasts in its LRPs are seldom realized. UP also points out that its rate increases have never kept pace with the RCAF-U.[85] UP presented evidence that, for the 1981-1997 period, its revenue per ton-mile remained level or declined. Based on this analysis of historic price-per-ton-mile data, UP assumed a zero growth in

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[84] The Rail Cost Adjustment Factor (RCAF) is a quarterly index of Class I railroad input prices. The RCAF was mandated by the Staggers Rail Act of 1980 and has been published since 1981. In 1989, a productivity adjustment was included to reflect the impact of national average railroad productivity changes on the original index. Since that time, the original RCAF index has been called the RCAF (Unadjusted) or RCAF-U. (The productivity-adjusted RCAF has been called the RCAF (Adjusted) or RACF-A.) FMC used RCAF-U forecasts made by the consulting firm Data Resources, Inc.

[85] UP claims that its average revenue per ton-mile dropped from 1981 to the present, while the RCAF-U was increasing. UP also states that contract data made available to FMC during discovery shows that the RCAF-U has increased more rapidly than its contract rates with FMC's competitors and the rates in its coal contracts. Moreover, UP argues that rate escalation provided for in contracts is overwhelmed by downward negotiation of rates as contracts expire and new contracts are negotiated — and indeed, quite often, by renegotiation to reduce rates *during* the term of contracts.

revenue per shipment. It points out that we have previously accepted past price trends as predictors of future trends.[86]

FMC asserts that UP's past rate trends were based on significant productivity gains that are not factored into the ORR's operations, because ORR's operating costs were assumed to inflate at the same rate as the RCAF-U, rather than the (lower) RCAF-A. UP counters that the ORR would still experience significant productivity gains from economies of density as the ORR's fixed investment would be spread out over an expanding traffic base.

We find the evidentiary submission of both sides on this issue to be seriously flawed. UP's proposed zero growth in revenue per shipment is inconsistent with its own LRP rate forecasts, which show increasing price trends, not the flat or declining rates that UP argues that we should use based on past experience. Furthermore, we are attempting here to forecast the growth in ORR's revenues, not the change in its revenue per ton-mile (which can be affected by the longer hauls that have resulted from past mergers).

FMC, on the other hand, offers insufficient support for its use of the RCAF-U as a measure of the rate of growth in rates. Nor does FMC explain why it used different procedures to forecast growth in traffic volume and rates for this period.

Because the best evidence of record as to future growth in rates are the forecasts developed by UP in its LRPs, we use the average annual growth rate derived from those LRPs to estimate the growth in ORR rates. These forecasts represent the revenue targets UP has set, based on its knowledge of the specific traffic and on forecasts of economic indicators. Thus, to estimate the growth in rates for the period beyond 2001 (or 2002) for all commodities (including coal and soda ash), we apply the geometric mean of the annual percentage change in rates contained in the LRPs for the years 1997 to 2001 (or 2002).

D. Operating Plan

After selecting the traffic group and determining the volumes and the broader parameters of the ORR network configuration, the parties must develop an operating plan for moving that amount and type of traffic over the ORR. Among other things, the operating plan must identify the number of trains and train characteristics (such as number of cars per train, locomotive consists and locomotive and car cycle times) and the number of operating personnel

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[86] UP cites *McCarty* at 475 n.32.

required.[87] Once an operating plan is developed that would accommodate the traffic group that is assumed, the system-wide investment requirements and operating expense requirements (including such expenses as locomotive and car leasing, personnel, material and supplies, and administrative and overhead costs) can be estimated. The parties must provide appropriate documentation to support their estimates.

The ORR was designed by FMC to be a "bridge" or "trunk" carrier, providing predominately trainload and unit-train service (with some multiple- and single-carload shipments of grain, coke, and general merchandise traffic). A large part of the ORR's traffic, however, would be crossover or other interline traffic having a prior or subsequent move on the UP or other railroads. Where UP provides unit-train *(e.g.,*coal) or regularly scheduled (e.g., intermodal) service between origins and destinations included in the ORR network, the ORR would provide the same service. Where the ORR would provide only a subset of UP's current service, additional transit time would be needed to account for time spent interchanging traffic between the ORR and the UP. As discussed below and in Appendix D, FMC used unsupported operating assumptions to estimate the number of trains, locomotives, cars, and operating personnel that would be required to service the ORR traffic group. Therefore, we cannot use FMC's operating plan to estimate the ORR's annual operating expenses.

In a significant number of instances FMC understated the number of trains, and in turn the locomotive and crew requirements, that would be necessary to move the traffic. FMC estimated the number of coal trains (which represents 67% of the ORR carload traffic) using the average number of cars per train for all trains moving over specific interchange points or destinations, but limited the maximum length of coal trains to 115 cars per train. Such an operating scenario would not meet shipper requirements and we reject FMC's contention that the ORR could dictate the type of service to be provided. The coal waybill data and workpapers of both parties show that UP moves coal trains containing various car consists (many exceeding 115 cars) that are customer driven. FMC's method

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[87] The number of trains that would be required to move the traffic group is a product of the number of cars in each train, any shipper requirements or limitations, and the number of carloads required to move the traffic group. The number and/or size of the trains that would be required to move the ORR traffic group, the terrain over which a train would move, and the amount of switching that would be involved dictate the number of locomotive, train and enginemen, locomotive and car repair, and inspection staff, and (to a lesser degree) the number of management and dispatch personnel that would be required. The size of the traffic group, any shipper requirements or limitations, car cycle time, load per car, and out-of-service time dictate the number of cars that would be required for the ORR.

of developing an estimate of coal locomotive requirements based on unrealistic assumptions not only understates locomotive requirements and ownership costs, but also locomotive maintenance and servicing costs and personnel requirements.[88] Also, FMC's method for calculating locomotive requirements for intermodal traffic and automobiles and automobile parts is undocumented, consisting of only a tabulation of decimal equivalents of locomotives required.[89] Further, FMC has not shown that its scheduled trains, and therefore locomotive requirements, could accommodate peak period demand or even some of the normal demands.[90]

Further, as explained in detail in Appendix D, FMC's approach to developing car cycle times, and in turn car requirements, is unsound because it failed to account for the time required to assemble empties requested by shippers, deliver empties to shippers, and switch loaded cars into line-haul trains.

FMC's approach also assumes an even flow of traffic by combining several multiple-car grain shipments into unit trains that would move together to a destination. FMC ignored the actual timing of these shipments, assuming that grain shippers would be willing to proffer freight cars in full trainload lots. UP points out that this level of efficiency could not be attained because grain shippers require an on-demand service and have significant volume fluctuations throughout the year.[91] Thus, UP calculated ORR freight car requirements using UP's actual cycle times for this traffic in 1996 and 1997.

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[88] Witness Burris (FMC Reb. V.S. Burris at 65) maintains that he adjusted his train lengths and associated locomotive and crew requirements to reflect actual train lengths. However, Burris' workpapers (FMC Reb. V.S. Burris WP 5137) reflect that the number of trains was developed using averages.

[89] FMC's opening evidence (FMC Open. V.S. Stern, Exh. 9) shows that the ORR would provide daily service from Kansas City to Seattle. This service would require three SD40 locomotives and, according to Stern's Exhibit 6, would take 63 hours. Adding 12 hours to turn and service the locomotive means that the total hours in this single service would be 75. Thus, at a minimum, the ORR would need three locomotive consists of three SD40s to provide this service. Yet, FMC only planned for 3.9 locomotives, *i.e.*, one consist. This example illustrates the problem with FMC's arithmetic calculation of locomotive requirements.

The largest difference in locomotive counts was for intermodal traffic. UP estimated that the ORR would need 312 locomotives, while FMC included only 109 locomotives for this service.

[90] UP criticizes FMC's calculation of locomotive requirements as based on arithmetic assumptions without adequate locomotives to handle the ORR's peak traffic periods. According to UP, only by reviewing the temporal flow of traffic, observing where carloads would originate (or be received) and terminate (or be delivered) and their associated tonnages, can an accurate estimate of the required locomotive fleet be determined. *See,* UP Reply V.S. Klick/Kent at 52-55. We agree.

[91] FMC acknowledges that "grain traffic can vary widely throughout the agricultural year and is very sensitive to market conditions." FMC Reb. V.S. Stern at 18.

UP's operating plan for the ORR is based on actual customer service requirements and supportable operating assumptions — actual number of trains, locomotives and car consists reflecting customer requirements and peak period demands and car requirements based on actual historical cycle times — that appear to cover all aspects of estimating the equipment and personnel requirements to move the ORR traffic group. Moreover, UP presented sufficient data to allow us to verify how it developed its requirements. Therefore, we use UP's operating plan for the ORR. However, we have made certain adjustments to it, as specified in Appendix D, to address certain concerns expressed by FMC on rebuttal and to exclude certain overstatements we discovered in reviewing UP's evidence.

E. Road Property Investment

Despite the fact that FMC and UP are reasonably close in their estimates of total track miles (approximately 5,500 and 6,000 miles, respectively),[92] there is a substantial difference between the parties regarding the total level of investment that would be required to construct the ORR. FMC claims the ORR could be built for approximately $7.1 billion, while UP claims that $12.5 billion would be necessary. Table C-1 in Appendix C provides a summary of the parties' investment figures by category and our restatement. As shown there, we have determined that approximately $8.4 billion would be required to construct the ORR.

Five investment categories account for approximately 80% of the difference between the parties. They are (in order of magnitude) grading, track construction, contingencies, engineering, and bridges. The difference between the parties' grading estimates resulted in large part from UP's use of a wider roadbed width west of Granger, WY; more gradual slopes for cut and fill areas; wider drainage ditches; and inclusion of an access road along the right-of-way. Inclusion of these improvements would require more land and a greater amount of earth to be moved. As discussed in Appendix C, we find that the ORR could operate without these additional improvements. The differences between the parties' estimates of track construction costs are due to UP's inclusion of greater number of track miles and its greater use of more costly premium rail. With few

[92] A large part of that difference (almost 400 miles) can be traced to (1) the difference between the parties' treatment of yards and (2) UP's inclusion of approximately 50 miles of track for bad-order set-out tracks, maintenance-of-way (MOW) tracks and locomotive service and repair tracks, which FMC did not include.

exceptions, we adopt UP's track miles and more extensive use of premium rail, but accept FMC's lower cost for premium rail. The next two categories — engineering and contingencies — are derivative expenses, calculated as a percentage of the total construction costs (excluding land). As explained in Appendix C, UP substantially overstated these percentages. Finally, the difference between the parties' estimates on bridge cost results from differing construction techniques. We find that FMC's bridge specifications would be feasible and lower in cost. These and other components of ORR road property investment are discussed in Appendix C.

F. Operating Expenses

Because the number of trains, locomotive and car requirements determine various operating expenses, and we use the operating plan developed by UP, we use UP's plan to determine the operating parameters that would be required by the ORR. Accordingly, we find that most of the operating expenses calculated by FMC are too low. For example FMC's locomotive and car lease costs, maintenance, and operating costs would be understated because we use UP's higher locomotive and car requirements. FMC's operating personnel figures are also understated because its operating plan understated the number of trains required to move the traffic and therefore the number of operating personnel required to move the trains.

The parties also differ on the unit costs that should be assigned to each expense category. As discussed in greater detail in Appendix D, we accept FMC's unit-cost figures for some items, but UP's unit-cost figures for others. These unit costs are then applied to the ORR operating requirements (*e.g.*, locomotives, cars, personnel) that have been determined for the ORR.

As explained in Appendix D, the primary differences between the total operating expense that we use and those calculated by UP result from UP's overstatement of operating personnel (other than train and enginemen) and general and administrative personnel. UP also inappropriately attempted to substitute its own labor costs for those included in the locomotive and car maintenance contracts relied upon by FMC, and double counted various other costs.

G. DCF Analysis

The DCF analysis compares the stream of revenues that would be generated by the ORR to the stream of costs that the ORR would incur, discounted to a common point in time. To do that, the DCF model computes and distributes[93] the total cost of the ORR over the 20-year SAC analysis period, thus determining the amount of revenues that would be needed by the ORR to cover its operating expenses, meet its tax obligations, recover its initial investment (minus the economic value of the assets remaining at the end of the 20-year analysis period), and obtain an adequate return on investment. The various components of the DCF calculations are described and discussed in Appendix E.

In this case the most significant disagreements between the parties regarding the DCF model relate to the rate of return that should be expected by the ORR and the appropriate time pattern that should be used for recovery of the ORR investment. As discussed in more detail in Appendix E, we conclude that the rate of return that the ORR would need to earn is the railroad industry's cost of capital, without the adjustments proposed by either party here.

With respect to the time pattern of recovery, FMC assigned each ton of freight a pro-rata share of the capital carrying charges[94] throughout the 20-year period, as has been done in prior SAC cases. This tonnage-based procedure was developed in *Nevada Power II*, 10 I.C.C.2d at 277 n.29, to address a situation where traffic levels fluctuated (both rising and falling) from year to year. Absent the inclusion of a tonnage variable, capital carrying charges (and thus presumably rates) would have vacillated (rising one year, only to fall and then rise again) — a rate pattern that we concluded would be unrealistic and inconsistent with railroad industry pricing practice.

In contrast, applying that same tonnage-based procedure here — where freight tonnage is projected to increase dramatically over the 20-year SAC analysis period — would result in a disproportionately large share of the capital carrying charges being assigned to the later part of the 20-year period, when the majority of traffic is projected to move. Moreover, it would place undue weight on the accuracy of traffic projections extending out 20 years. As noted above, traffic projections are inherently uncertain and the projections that we use here

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[93] *See, Bituminous Coal — Hiawatha, UT to Moapa, NV*, 6 I.C.C.2d 1, 97-102 (1989) (*Nevada Power I*); *Nevada Power II*, 10 I.C.C.2d at 274-76.

[94] Capital carrying charges are the amount needed to provide a return on, and recovery of, the capital invested, as well as the revenues needed to cover tax liability.

are hotly contested. We do not believe that our maximum reasonable rate findings should be driven by these projections any more than necessary.

Thus, we allocate the capital carrying charges here on a yearly basis, instead of a tonnage basis. In that way, rates will be affected by future traffic only if and when that traffic materializes. Indeed, even if we could be sure that all of the forecasts here will ultimately be realized, we do not believe that it would be fair or proper to set the rates that UP can now charge based on economies of density and revenue contributions that do not yet exist.

The results of our DCF calculations are shown in *Appendix E* at *Table E-1*. These results show that, under the current rate structure, in each year of the 20-year SAC analysis period, the ORR would generate greater revenues than it would need to cover all the costs that would be incurred in and/or assigned to that year.

CONCLUSIONS

Based on the SAC analysis, we find that the 15 challenged rates that are subject to maximum rate regulation are unreasonably high. Reparations are awarded for past movements, and maximum reasonable rates are prescribed for future movements in accordance with the tables set forth in Appendix F. Interest is also awarded in accordance with 49 CFR Part 1141. The total amount of reparations and interest are to be calculated by the parties in accordance with this decision. If the traffic forecasts upon which these rate prescriptions are based do not materialize, the parties may either agree upon appropriate revisions to these prescriptions that are consistent with our procedures here or submit an appropriate petition to us to reopen the record in this proceeding. *See, Arizona II* at 74-75.

This decision will not significantly affect the quality of the human environment or the conservation of energy resources.

VICE CHAIRMAN BURKES, commenting:

As indicated in my comments in our decision in *Western Coal Traffic League v. Union Pacific Railroad Co.*, 4 S.T.B. 685 (2000) (*Western Coal v. Union Pacific*), I am concerned about the accounting of certain special charges that Union Pacific Railroad Company included in its 1997 R-1 Annual Report to the Board. The accounting of those special charges has an impact on our findings in this proceeding.

The accounting and allocation of these charges can have a significant impact in regulatory proceedings before the Board. The R-1 reports are used to develop

Uniform Railroad Costing System or URCS data for the Class I carriers. The inclusion of these special charges can have a significant impact on the resulting URCS unit cost data. As we correctly stated in that decision "the effect of overstating variable costs would be to decrease the amount of traffic potentially subject to our rate reasonableness authority, and limit the rate relief available for such traffic."

The importance of accurate accounting of these special charges is demonstrated here. For example, the STB determined that the revenue/cost ratio associated with one of the movements at issue was 179 percent. Therefore, it is possible that the inclusion of special charges resulted in the elimination of our jurisdiction over this movement. In addition, these special charges would have an impact on the resulting reasonable rates for the movements that we retained jurisdiction and were found to exceed a reasonable level.

As indicated in my comments in *Western Coal v. Union Pacific*, given the size, frequency and potential impact of these special charges, I believe that we must continue to closely monitor the railroads' accounting of these charges. I also believe that it may be time to review the treatment of these charges in regulatory proceedings.

It is ordered:

1. UP's request to reopen the record, filed November 24, 1999, is denied.
2. The petition for partial revocation of the exemption for coke is denied.
3. The complaint is dismissed with respect to the rate applicable to the transportation of coke.
4. With respect to the other 15 rates embraced in the complaint, defendant shall, within 60 days, establish and maintain rates for the issue traffic that do not exceed the maximum reasonable rates prescribed in this decision.
5. Defendant shall pay reparations and interest, in accordance with this decision, for all shipments moving under the 15 rates found in this decision to be unreasonable that moved prior to the establishment of reasonable rates pursuant to ordering paragraph 4.
6. This decision is effective June 12, 2000.

By the Board, Chairman Morgan, Vice Chairman Burkes and Commissioner Clyburn. Vice Chairman Burkes commented with a separate expression.

APPENDIX A – R/VC CALCULATIONS FOR FMC TRAFFIC

As noted above, the traffic covered by this complaint includes 16 recurring movements. The revenues generated by that traffic and the costs of providing service must be estimated to determine whether the revenue-to-variable cost percentage meets or exceeds the 180% jurisdictional threshold of 49 U.S.C. 10707(d). The parties' R/VC calculations and our findings for each movement are summarized in Table A-1.[95] We find that — with the exception of coke moving in single-car shipments and movements in 4th Quarter 1998 of soda ash to Chicago for interchange (movement E) — the challenged rates produce R/VC percentages that exceed the jurisdictional threshold.

[95] The parties used averages for certain origin/destination (O/D) pairs. Because we have the ability to calculate more individualized data, our restatement shows data for each individual O/D combination by car type. Our restatement shows R/VC percentages for only those quarters during which any issue traffic moved. In Table A-1 the percentages shown for FMC are from FMC Reb. V.S. Stedman - Exh. CAS-24; the percentage shown for UP are from UP Reb. Workpapers KKA 1 through KKA 1254; and the percentages shown for our restatement are from Table A-13 of this decision.

Table A-1 — R/VC PERCENTAGES

				3 QTR 1997						4 QTR 1997					
				FMC CARS			RR CARS			FMC CARS			RR CARS		
MOVEMENT	COMM.	ORIGIN	DESTIN.	FMC	UP	STB	FMC	UP	STB	FMC	UP	STB	FMC	UP	STB
A (Single Car) - Local	SA	Westvaco, WY	Clearing, IL	560	200		530	237		549	207	**218**	522		
B (Single Car) - Local	SA	Westvaco, WY	Chicago, IL		200	**212**		237	**272**		207				
C (Single Car) - Local	SA	Westvaco, WY	Irondale, IL	557	191	**201**	527			547	191	**201**	519		
D (Single Car) - Local	SB/SS	Westvaco, WY	Irondale, IL	613	194	**203**	478	235	**249**	604	222	**234**	477		
E (Single Car) - Interline	SA	Westvaco, WY	Chicago, IL		179										
F (Single Car) - Interline	SB/SS	Westvaco, WY	Chicago, IL	500	185	**195**	467			500	212	**226**	460		
G (Single Car) - Local	SA	Westvaco, WY	Galt, IL	503	195	**210**	418			497	195	**210**	413		
H (Single Car) - Local	SA	Westvaco, WY	Lawrence, KS	644	225	**245**	548			634	225	**244**	540		
I (Trainload) - N Platte Ex.	SA	Westvaco, WY	Kansas City, MO		**244**			329							
I (Trainload) - Denver	SA	Westvaco, WY	Kansas City, MO		226			316							
J (Single Car) - Interline	SA	Westvaco, WY	Kansas City, MO		220										
K (Trainload) - Local Ex.	SA	Westvaco, WY	Portland, OR		210			259							
L (T104 Car) - Local	PHOS	Don, ID	Westvaco, WY	590	244	**269**				594	244	**268**			
L (T644 Car) - Local	PHOS	Don, ID	Westvaco, WY	590	226	**248**				594	224	**246**			
M (T104 Car) - Local	PHOS	Don, ID	Lawrence, KS	507	202	**219**				500	217	**235**			
M (T644 Car) - Local	PHOS	Don, ID	Lawrence, KS	507	195	**210**				500	193	**208**			
N (T104 Car) - Interline	PHOS	Don, ID	Chicago, IL	630	252	**269**				620	256	**273**			
N (T644 Car) - Interline	PHOS	Don, ID	Chicago, IL	630	215	**229**				620	219	**233**			
O (Trainload) - Local	PHOS RK	Dry Valley, ID	Don, ID				325	176	**233**				328	171	**224**
P (Single Car) - Local	COKE	Glencoe Jct., WY	Don, ID				283	95	**118**				290	102	**124**
P (Multiple Car) - Local	COKE	Glencoe Jct., WY	Don, ID				297	134	**184**				304	144	**194**

Table A-1 — R/VC PERCENTAGES (Continued)

				1 QTR 1998						2 QTR 1998					
				FMC CARS			RR CARS			FMC CARS			RR CARS		
MOVEMENT	COMM.	ORIGIN	DESTIN.	FMC	UP	STB	FMC	UP	STB	FMC	UP	STB	FMC	UP	STB
A (Single Car) - Local	SA	Westvaco, WY	Clearing, IL	563			532			570			539		
B (Single Car) - Local	SA	Westvaco, WY	Chicago, IL												
C (Single Car) - Local	SA	Westvaco, WY	Irondale, IL	558	187	**192**	532		**252**	559	185	**190**	538		
D (Single Car) - Local	SB/SS	Westvaco, WY	Irondale, IL	620	209	**217**	487			626	219	**225**	493		
E (Single Car) - Interline	SA	Westvaco, WY	Chicago, IL	482	176	**181**	472	233	**248**	488	176	**180**	479		**248**
F (Single Car) - Interline	SB/SS	Westvaco, WY	Chicago, IL	510	224	**233**	471			519	201	**222**	477		
G (Single Car) - Local	SA	Westvaco, WY	Galt, IL	509	195	**204**	421			515	200	**210**	426		
H (Single Car) - Local	SA	Westvaco, WY	Lawrence, KS	648	227	**238**	550	245	**280**	657	229	**241**	561		**284**
I (Trainload) - N Platte Ex.	SA	Westvaco, WY	Kansas City, MO	589	237	**243**	575	325	**355**	596		**244**	580		**355**
I (Trainload) - Denver	SA	Westvaco, WY	Kansas City, MO												
J (Single Car) - Interline	SA	Westvaco, WY	Kansas City, MO	576	221	**226**	531			580	220	**225**	537		
K (Trainload) - Local Ex.	SA	Westvaco, WY	Portland, OR	437	216	**229**	432	271	**312**	443	210	**222**	435	263	**300**
L (T104 Car) - Local	PHOS	Don, ID	Westvaco, WY	602	246	**265**				609	247	**267**			
L (T644 Car) - Local	PHOS	Don, ID	Westvaco, WY	602	226	**243**				609	227	**243**			
M (T104 Car) - Local	PHOS	Don, ID	Lawrence, KS	513	223	**233**				522	222	**232**			
M (T644 Car) - Local	PHOS	Don, ID	Lawrence, KS	513	194	**201**				522	195	**202**			
N (T104 Car) - Interline	PHOS	Don, ID	Chicago, IL	636	255	**261**				647	257	**263**			
N (T644 Car) - Interline	PHOS	Don, ID	Chicago, IL	636	221	**225**				647	222	**226**			
O (Trainload) - Local	PHOS RK	Dry Valley, ID	Don, ID				332	183	**239**				335	183	**238**
P (Single Car) - Local	COKE	Glencoe Jct., WY	Don, ID				283	97	122				296	104	129
P (Multiple Car) - Local	COKE	Glencoe Jct., WY	Don, ID				297	137	**189**				311	146	**200**

Table A-1 — R/VC PERCENTAGES (Continued)

				3 QTR 1998						4 QTR 1998					
				FMC CARS			RR CARS			FMC CARS			RR CARS		
MOVEMENT	COMM.	ORIGIN	DESTIN.	FMC	UP	STB	FMC	UP	STB	FMC	UP	STB	FMC	UP	STB
A (Single Car) - Local	SA	Westvaco, WY	Clearing, IL	570			532			569			532		
B (Single Car) - Local	SA	Westvaco, WY	Chicago, IL												
C (Single Car) - Local	SA	Westvaco, WY	Irondale, IL	564	188	**192**	529			568	190	**195**	529		
D (Single Car) - Local	SB/SS	Westvaco, WY	Irondale, IL	618	204	**208**	484			625	195	**199**	484		
E (Single Car) - Interline	SA	Westvaco, WY	Chicago, IL	482	176	**180**	472		**255**	485	174	179	477		**255**
F (Single Car) - Interline	SB/SS	Westvaco, WY	Chicago, IL	514	201	**224**	469			507	209	**215**	469		
G (Single Car) - Local	SA	Westvaco, WY	Galt, IL	511			417			509			418		
H (Single Car) - Local	SA	Westvaco, WY	Lawrence, KS	655	228	**240**	550			650	230	**242**	550		
I (Trainload) - N Platte Ex.	SA	Westvaco, WY	Kansas City, MO	595		**246**	575		**361**	596		**247**	573		
I (Trainload) - Denver	SA	Westvaco, WY	Kansas City, MO												
J (Single Car) - Interline	SA	Westvaco, WY	Kansas City, MO	576	222	**225**	533			583	222	**227**	533		
K (Trainload) - Local Ex.	SA	Westvaco, WY	Portland, OR	439	216	**227**	435		**313**	436		**226**	428		
L (T104 Car) - Local	PHOS	Don, ID	Westvaco, WY	609	249	**268**				603	248	**268**			
L (T644 Car) - Local	PHOS	Don, ID	Westvaco, WY	609	228	**245**				603	228	**245**			
M (T104 Car) - Local	PHOS	Don, ID	Lawrence, KS	523	225	**234**				519	224	**233**			
M (T644 Car) - Local	PHOS	Don, ID	Lawrence, KS	523	196	**202**				519	195	**202**			
N (T104 Car) - Interline	PHOS	Don, ID	Chicago, IL	646	258	**264**				642	255	**261**			
N (T644 Car) - Interline	PHOS	Don, ID	Chicago, IL	646	223	**227**				642	223	**227**			
O (Trainload) - Local	PHOS RK	Dry Valley, ID	Don, ID				330	174	**232**				332	178	**236**
P (Single Car) - Local	CO	Glencoe Jct., WY	Don, ID				287	101	128				264	99	122
P (Multiple Car) - Local	CO	Glencoe Jct., WY	Don, ID				301	142	**197**				277	139	**188**

Commodity Guide: (SA) = Soda Ash; (SB/SS) = Sodium Bicarbonate/Sesquicarbonate; (PHOS) = Phosphorus; (PHOS RK) = Phosphate Rock; and (CO) = Coke.

A. General Cost Estimation Procedures

The Uniform Railroad Costing System is a cost accounting process that calculates system-average variable costs of Class I railroads. URCS reflects the extent to which different types of costs incurred in the rail industry have been found to change in direct proportion to changes in output. Because a carrier's systemwide average costs are not necessarily representative of the costs of providing a particular service, however, movement-specific adjustments are sometimes made to better reflect the costs attributable to providing a particular service.

FMC relied on UP's 1996 URCS for costing 3rd and 4th Quarter 1997 and 1st and 2nd Quarter 1998 movements; and it relied on the 1997 URCS for 3rd and 4th Quarter 1998 and 1st Quarter 1999 movements. FMC's use of a 1996 URCS application is inappropriate, as all of the traffic at issue moved after September 1, 1997, and 1997 data were available when its evidence was filed.

UP relied on a 1997 URCS for all quarters with general adjustments to: (1) exclude expenses recorded in its R-1 report in Account 80 (other elements of investment) and in Account 76 (interest during construction) and (2) include expenses in Account 90 (construction in progress).[96] UP relies on *Georgia Power,*[97] where such adjustments were accepted, but UP has not explained why the adjustments should be made here. Indeed, the adjustments have generally not been accepted in subsequent maximum rate cases[98] and are rejected here as inconsistent with current procedures.

Because both parties' presentations are flawed, we use the unadjusted UP 1997 URCS (run of October 27, 1998) to develop variable cost for all 3rd and 4th Quarter 1997 issue movements.[99] In addition, UP's 1998 URCS (run of October 5, 1999) is now available and we use this information to calculate variable costs for the 1998 traffic.

B. Movement-Specific Adjustments

1. Operating Statistics and Traffic Characteristics

The parties disagree on the proper modification of URCS system-average variable cost for service units and traffic characteristics. We discuss the areas of disagreement below.

a. Tare Weight

Both parties calculated an average rail car tare weight for each series of issue O/D movements. UP developed quarterly averages, whereas FMC calculated a single average for the entire period.

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[96] The URCS procedures normally exclude expenses in Account 90 and include expenses in Account 76. Accounts 90 and 76 are related property accounts. (Account 90 contains investment in construction work in progress. Account 76 contains accrued interest on funds used during construction.) To avoid a double count of expenses, expenses can be included in only one of the accounts. *See, Establishment of Adequate Railroad Revenue Levels*, 358 I.C.C. 844, 878-882 (1978) (*Ex Parte 338*). Nevertheless, URCS allows for modification of this method if the requirements set forth *Ex Parte 338* are met. UP reversed our adopted procedures with respect to Accounts 76 and 90 without providing any explanation. Expenses in Account 80 are not included in URCS.

[97] *Georgia Power Co. et al. v. Southern Ry. et al.*, No. 40581 (ICC served November 8, 1993) (*Georgia Power*).

[98] *See, e.g., West Texas; Arizona I.*

[99] *See, West Texas*, 1 S.T.B. at 717.

Because traffic movements varied by quarter, UP's approach provides a more accurate reflection of costs in each quarter and is accepted as the better evidence of record.

b. Lading Weight

The parties provided conflicting carload and tonnage movement data in their respective calculations of average lading weights. For phosphorus movements, we accept UP's calculations because FMC, unlike UP,[100] provided no breakdown between T-104 and T-644 tank cars. For the other movements on which there was a conflict, we cannot determine which movement data are more accurate. In the absence of any basis for concluding that one party's evidence is more accurate, we have restated lading weights as the average of the two parties' data.

c. Routing and Miles

The parties agree on the total track miles used by UP to serve FMC's traffic. Their total route miles differ as a result of disagreements over the service provided FMC at its Don, ID facility. As explained below, we adopt UP's route mileage.

I. Assignment of Empty Return from Don to Glencoe Junction

Coal is transported from the Elkol coal mine in Wyoming to FMC's plant at Kemmerer and processed into coke. Empty coal cars are then reloaded with coke for movement to FMC's phosphorus production facility at Don.[101] After the coke is unloaded at Don, empty cars return to Glencoe Junction, WY — the staging area for empty cars used by the Elkol mine and, occasionally, the coke plant.

FMC assigned no empty return miles to the movement of empty coke cars from its plant to Glencoe Junction. It contends that the distance those cars move should be assigned to the next loaded movement. UP argues that cars generally should be considered as dedicated to coke service from the time they leave the coke facility until they reach the staging area at Glencoe Junction. In addition, 6% of the cars should be considered in coke service from the time they move empty from Glencoe Junction to be loaded at the coke facility until they return to Glencoe Junction.

We agree with UP. Empty cars leaving Don are not positioned and ready for reloading until they reach Glencoe Junction. Thus, FMC's argument that once the cars are unloaded at Don they are ready for reloading is flawed. FMC has not shown why its coke operations should not be responsible for any empty car movements. Indeed, if not for the fact that coal cars from Elkol can be reloaded with coke, additional miles would be appropriately assignable to the coke operations.

ii. Service to Don

FMC's phosphorus plant at Don is served by UP's local train LIP33, which operates out of the Pocatello Yard. UP picks up loaded phosphorus cars and coke empty return cars at Don and, before returning to the Pocatello Yard, proceeds further to Borah when necessary to serve other industries on the line. Thus, UP added 48.7 miles to the direct Pocatello-Don route distance for the round-trip

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[100] UP Reb. V.S. Kent/Fisher, Exh. KKA-1.

[101] Coke has a slightly greater volume than the coal from which it is processed. Thus, UP has to move an empty car from Glencoe Junction to FMC's coke plant for loading with coke 6% of the time.

to Borah. As UP explains, this procedure avoids the need for (and costs of) making a second stop at Don on the way back from serving its other customers on the line.

UP's initial evidence was based on a special study of coke movements conducted August 24-29, 1998, which showed that LIP33 departed the Don plant with empty coke cars, traveled west to Borah, ID (approximately 22 miles), reversed direction and doubled back past FMC's plant to the Pocatello Yard. FMC assailed UP's special study as unrepresentative because FMC's Glencoe Junction coke plant had been closed for maintenance the prior week. In fact, only seven coke cars, rather than the normal 59, moved during the study period. FMC then conducted its own special study of UP's operations serving the Don facility during the week February 28 to March 6, 1999. FMC's study showed that UP does not consistently haul all traffic from Don to Borah and then back to Pocatello. Rather, the UP local train sometimes stops at Don on the way back from Borah to pick up cars. In one instance, an UP train returned directly to Pocatello with FMC's cars after serving the Don plant. Accordingly, FMC excluded the 48.7-mile additive from its development of variable costs for the phosphorus and coke movements.

UP conducted another study in which it identified all cars released by FMC at Don during March 1999 and surveyed how many of those cars passed its automatic equipment identification (AEI) scanner at Michaud, ID (between Don and Borah). UP found that 83% of the cars released by FMC at Don in March passed the AEI scanner at Michaud. On the basis of this information, UP included the 48.7 miles for 83% of FMC's movements.

We find that UP's survey of all cars for a whole month is the most representative survey of the operations and, therefore, is the best evidence of record regarding the routing of loaded phosphorus and empty coke cars at Don. Therefore, we accept its 48.7-mile additive for 83% of FMC's traffic.

d. Car Cycle Time

The parties' disagreement on car cycle times falls into four categories, each of which we discuss here.

I. Exclusion of Records

In discovery UP produced its car cycle time data base. UP eliminated clearly erroneous data where car cycles exceeded 45 days. FMC also adjusted the data base, deleting traffic that: (a) had incomplete records; (b) originated or terminated at locations not at issue in this proceeding; (c) passed through stations not located between the origin and destination; (d) traveled in the opposite direction (*e.g.*, showing loads in what should be the empty direction); (e) traveled in the wrong direction (*e.g.*, westbound cars from Westvaco moving eastbound toward Chicago); or (f) had stations out of sequence (*e.g.*, stations in Wyoming, followed by stations in Iowa, then Nebraska).

FMC's adjustments, which remove several types of unreliable observations, are more exacting and we find that FMC's adjustments are the better evidence of record.

ii. Bad-Order Time

UP included a 10% spare margin to reflect the additional cars needed to provide service while cars are being repaired. UP also included in its cycle time calculation the time cars are undergoing repairs (bad order) before being placed back in service. Because the spare margin accounts for the additional equipment required to compensate for bad-order time, it is inappropriate to include both a spare margin and the time cars are out of service in the development of cycle times. Accordingly, we have removed the bad-order time to prevent a double count of car-ownership cost.

iii. Phosphate Rock and Coke Cycle Time

UP developed a car cycle time for its entire fleet of hopper cars and estimated FMC's cycle time based on the ratio of FMC cars to all cars in the fleet. FMC developed a car cycle time for only those cars used to transport FMC phosphate rock and coke. With one exception, FMC's specific car cycle time includes all time spent at origin and destination, and all loaded and empty travel time.[102] Because FMC's evidence specifically focused on the service it receives, it represents the best estimate of the time UP hopper cars spend transporting FMC's traffic.

iv. Soda Ash and Sodium Bi- & Sesquicarbonate Cycle Time

A mix of private and railroad-owned cars is used to move soda ash and sodium bicarbonate and sesquicarbonate traffic. The parties agree that, since publication of the challenged rates, railroad-owned cars have been used primarily to meet peak demand. Accordingly, UP's cycle time data base reflects relatively few railroad-owned cars.

FMC used the entire mix of private and railroad-owned cars to estimate an average cycle time for railroad-owned cars. Because the data supplied in discovery contained few, if any, movements in railroad-owned cars, FMC argues that it was necessary to include private cars in its analysis in order to have a meaningful sample size. UP argues that, because railroad-owned cars are used primarily for peak demand, the cycle times of private cars and railroad-owned cars differ significantly.

Given the lack of data on railroad-owned cars, we find that it was not unreasonable for FMC to include both private- and railroad-owned cars in its cycle time analysis. Furthermore, as discussed above, UP's cycle time analysis is flawed because its data base contained erroneous records and inappropriately included bad order time. Thus, we accept FMC's evidence.

Table A-2 shows the car cycle times for each O/D pair.

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[102] FMC reflected only 7.0 hours for the empty-return portion of the coke moves because it contends that only 6% of empty-coke-car movements from Don are next reloaded at FMC's coke plant. As explained above, there is additional empty time (a total of 116.8 hours) associated with service to FMC's coke facility.

Table A-2
Car Cycle Time (Hours)

Movement	UP*	FMC**	STB
Move A -Westvaco, WY to Clearing, IL (SA) - Local	651.47	308.1	308.1
Move B -Westvaco, WY to Chicago, IL (SA) - Local	651.47	308.1	308.1
Move C -Westvaco, WY to Irondale, IL (SA) - Local	651.47	345.3	345.3
Move D -Westvaco, WY to Irondale, IL (SB/SS) - Local	651.47	624.8	624.8
Move E -Westvaco, WY to Chicago, IL (SA) - Interline	385.76	262.8	262.8
Move F -Westvaco, WY to Chicago, IL (SB/SS) - Interline	385.76	329.7	329.7
Move G -Westvaco, WY to Galt, IL (SA) - Local	XXX	721.7	721.7
Move H -Westvaco, WY to Lawrence, KS (SA) - Local	686	409.9	409.9
Move I -Westvaco, WY to Kansas City, MO (SA) - Export	302.67	191.1	191.1
Move J -Westvaco, WY to Kansas City, MO (SA)-Domestic	XXX	285.1	285.1
Move K -Westvaco, WY to Portland, OR (SA) - Export	451.31	252.1	252.1
Move L -Don, ID to Westvaco, WY (PHOS) - Local	XXX	XXX	XXX
Move M -Don, ID to Lawrence, KS (PHOS) - Local	XXX	XXX	XXX
Move N -Don, ID to Chicago, IL (PHOS) - Interline	XXX	XXX	XXX
Move O -Dry Valley, ID to Don, ID (PHOS RK) - Local	159.69	82.9	82.9
Move P -Glencoe Jct., WY to Don, ID (CO) - Local	471.47	167.5	277.3

* UP Reb. Workpapers KKA 001829-41.
** FMC Reb. V.S. Stedman, Exh. CAS-28.

e. Locomotive Cycle Time

Locomotive cycle time hours are used in the development of locomotive ownership costs. Both parties based their calculations on UP's train movement data provided in discovery and claim to include all appropriate factors in their calculations.[103] However, UP and FMC do not agree on the cycle times for the various movements.

We cannot determine why the parties reached different results, nor can we duplicate their calculations. Because UP's data generally (12 of 16 issue movements) reflect the more conservative locomotive cycle times, we accept its evidence. The results are presented in Table A-3.

Table A-3
Locomotive Cycle Time (Hours)

Movement	UP*	FMC**	STB
Move A-Westvaco, WY to Clearing, IL (SA) - Local	104.43	125.3	104.43
Move B-Westvaco, WY to Chicago, IL (SA) - Local	104.43	125.3	104.43
Move C-Westvaco, WY to Irondale, IL (SA) - Local	104.43	134.5	104.43
Move D-Westvaco, WY to Irondale, IL (SB/SS) - Local	104.43	136.4	104.43
Move E-Westvaco, WY to Chicago, IL (SA) - Interline	104.43	125.7	104.43
Move F-Westvaco, WY to Chicago, IL (SB/SS) - Interline	104.43	130.7	104.43
Move G-Westvaco, WY to Galt, IL (SA) - Local	66.36	146.4	66.36
Move H-Westvaco, WY to Lawrence, KS (SA) - Local	79.7	99.8	79.7
Move I-Westvaco, WY to Kansas City, MO (SA) - Export	116.87	110.7	116.87
Move J-Westvaco, WY to Kansas City, MO (SA)-Domestic	79.2	96.5	79.2
Move K-Westvaco, WY to Portland, OR (SA) - Export	138.56	131.8	138.56
Move L-Don, ID to Westvaco, WY (PHOS) - Local	38.12	44.1	38.12
Move M-Don, ID to Lawrence, KS (PHOS) - Local	118.71	148.1	118.71
Move N-Don, ID to Chicago, IL (PHOS) - Interline	142.81	168.5	142.81
Move O-Dry Valley, ID to Don, ID (PHOS RK) - Local	28.11	13.7	28.11
Move P-Glencoe Jct., WY to Don, ID (CO) - Local	36	19.1	36

* UP Reb. Workpapers Kent/Fisher, Vols. 2 and 3 (p.9 of each variable cost calculation).
** FMC Reb. V.S. Stedman, Exh. CAS-27.

[103] FMC contends that it calculated locomotive cycle time from when a train departs its origin until it arrives at its destination. UP maintains that its cycle times reflect the total time locomotives operate in service handling issue movements.

f. Road and Yard Switching Minutes

FMC developed initial estimates of origin, destination, interchange and inter/intra-train (I&I) switching minutes for its traffic based on a special study of UP's operations. UP disagreed with FMC's estimates and conducted its own study. We discuss the various differences produced by the two studies.

I. Switch Minutes at Don

The parties' special studies of UP's Don operations were conducted at different times. As a result, the parties disagree on the switching minutes assigned to the coke and phosphorus moves. Each maintains that the timing of its study offers more accurate data in terms of measuring the actual operating characteristics of the issue traffic. We have no reason to doubt the accuracy of the data gathered by either party. Nor can we conclude that any particular day or week is "average" in terms of operating norms. Rather, it is reasonable to expect the results of special studies to vary on a daily or weekly basis. Therefore, we average the results of the two parties' studies.

ii. Switch Minutes at Pocatello and Nampa

FMC claims that UP double-counted the time associated with locomotive hostling[104] at Pocatello and Nampa by including it both in switch minutes per car at Pocatello and as part of locomotive servicing in the UP system-average gross ton-mile and locomotive unit-mile costs. UP points out that its accounting records for both locations include no expenses associated with locomotive servicing (the cost category in which hostling expenses would be recorded).

FMC has not shown that UP's accounting records are inaccurate or that any locomotive time at Pocatello or Nampa was attributable to hostling. Accordingly, we accept UP's measurement of the time associated with switching at Pocatello and Nampa.

iii. Switch Minutes at Lawrence

Both parties conducted switching studies at Lawrence. The difference between their figures is minimal[105] and results from a difference between the number of classification switches at Lawrence required for soda ash cars. Again, the parties' special switching studies were conducted during different time periods and observed different operating conditions. In order to develop the most representative figures based on the maximum number of observations, we average the results of the parties' studies.

iv. Switch Minutes at Chicago

UP must interchange all FMC traffic destined to Chicago. Because UP trains destined for interchange at Chicago contain single carloads of different commodities destined to various receivers, classification is performed before the final line-haul movement into Chicago. The parties differ on how such service should be costed. UP removed the URCS cost for system-average I&I

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[104] Hostling is the movement of "light" locomotives (locomotives not performing any service), such as the movement of locomotives to repair shops.

[105] UP maintains that the average switch consumes 41 seconds per car, whereas FMC calculates 24 seconds per car.

switches (one every 200 miles) and substituted the costs for I&I switches at those specific terminals where UP actually performs classifications. UP treated the line-haul and the Chicago switching as single-car operations. FMC maintains that, because UP delivers its traffic in trainload quantities to carriers in and around the Chicago area, the switching costs should reflect a trainload switch at Chicago and a prior classification switch.

We have analyzed this issue using the eastbound movements of soda ash in covered hoppers that originate at Westvaco, are classified at North Platte, and then interchanged at Chicago (movement E) with either the Belt Railway Company of Chicago (BRC) or Consolidated Rail Corporation (Conrail),[106] and the westbound interchange of empty returns with UP. (Our restatement for all movements is generally based on our conclusions with regard to these representative interchanges.)

BRC Interchanges — FMC contends that on eastbound movements UP incurs costs only for trainload interchanges at Chicago (BRC's Clearing Yard) and a classification switch at North Platte. FMC does not address westbound interchanges. UP contends that, because cars are destined for multiple shippers, the Chicago eastbound interchange cannot be considered as a trainload interchange. Rather, UP contends that both eastbound and westbound movements should be treated as interchanges of single cars.

Based on our understanding of the operating practices surrounding FMC's BRC interchange traffic, we agree with FMC regarding eastbound interchanges. UP receives FMC traffic at North Platte, where it is classified into trains for interchange at Chicago. Therefore, inclusion of an I&I switch at North Platte is appropriate. Once a train is formed, however, it is delivered to BRC with no further UP involvement. Because UP is not involved in breaking up the eastbound train for delivery to various destinations in Chicago, UP incurs only the costs associated with a trainload interchange with BRC. Regarding westbound movements, FMC does not contest UP's characterization of westbound interchanges, and we therefore accept UP's evidence.

Conrail Interchanges — FMC's traffic arriving at North Platte and destined for Conrail is classified into a train with blocks of cars destined for Conrail yards at Elkhart, IN, Conway, IL, Cleveland, OH, and Selkirk, NY. This traffic then travels to UP's Proviso Yard in Chicago, where the Conway and Selkirk blocks are set-out for Conrail. Proviso crews combine FMC's Elkhart block from North Platte with other, non-FMC Elkhart blocks (which have been classified at Proviso) to form a train that is then moved to the Conrail interchange point at Ashland Avenue. Proviso crews build separate Conway, Selkirk and Cleveland trains that include cars from North Platte and move these trains separately from Proviso to Ashland Avenue, where they are interchanged with Conrail. UP claims that FMC cars interchanged with Conrail qualify, both operationally and from an URCS costing perspective, as single-car interchange movements.

FMC notes that traffic interchanged with Conrail undergoes much the same handling as the traffic destined for BRC's Clearing yard. Thus, FMC applied the same costing methodology as it did to BRC interchanges.

We find that both FMC and UP erred in their costing treatment for eastbound traffic. The traffic is classified at North Platte and blocked for at least four different Conrail yards. Upon reaching the Proviso yard, each of the four blocks is broken out and combined with other traffic

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[106] Because of the manner in which switch-engine-minute evidence is presented by the parties, we are unable to identify, for costing purposes, which of the potential interline carriers interchanges FMC traffic with UP. Different switch-engine minutes are rightfully associated with different interline carriers. Accordingly, in our restatement we average the switch-engine minutes presented by the parties. While this approach may overstate variable switching costs for some movements and understate them for others, it should result in an overall neutral outcome.

destined for the various Conrail yards. Trains destined for Cleveland, Elkhart, Conway, and Selkirk are delivered separately to the Ashland Avenue interchange with Conrail. This operation does not involve either trainload or single-car interchanges with Conrail. Rather, it involves multiple-car interchanges. Under long-established procedures,[107] such traffic should receive a 50% reduction to UP's system-average interchange switching minutes.

For westbound empty moves to North Platte, Conrail delivers empty cars to UP at Proviso. UP maintains that westbound movements should be treated as a single-car switch at Proviso with a subsequent I&I switch at North Platte. FMC does not contest this treatment of westbound cars. Therefore, we accept UP's uncontested evidence.

Table A-4 shows the restated switch-engine minutes.[108]

Table A-4
Restated Switch-Engine Minutes

Movement	Yard Switch	Road-Yd Switch	Road-LH Switch	Total
Move A -Westvaco, WY to Clearing, IL (SA) - Local	5.460	4.004	4.004	13.47
Move B -Westvaco, WY to Chicago, IL (SA) - Local	5.460	4.004	4.004	13.47
Move C -Westvaco, WY to Irondale, IL (SA) - Local	5.460	4.004	4.004	13.47
Move D -Westvaco, WY to Irondale, IL (SB/SS) - Local	5.460	4.004	4.004	13.47
Move E -Westvaco, WY to Chicago, IL (SA) - Interline	5.460	6.006	4.004	15.47
Move F -Westvaco, WY to Chicago, IL (SB/SS) - Interline	5.460	6.006	4.004	15.47
Move G -Westvaco, WY to Galt, IL (SA) - Local	16.380	1.820	18.564	36.77
Move H -Westvaco, WY to Lawrence, KS (SA) - Local	9.320	3.646	29.694	42.66
Move I -Westvaco, WY to KC, MO (SA) - Export	1.820	4.745	4.004	10.57
Move J -Westvaco, WY to KC, MO (SA) - Domestic	5.460	8.009	4.004	17.47
Move K -Westvaco, WY to Portland, OR (SA) - Export	6.773	1.412	4.004	12.19
Move L -Don, ID to Westvaco, WY (PHOS) - Local	15.765	3.640	19.695	39.10
Move M -Don, ID to Lawrence, KS (PHOS) - Local	19.645	3.715	38.910	62.27
Move N -Don, ID to Chicago, IL (PHOS) - Interline	17.499	4.850	14.272	36.62
Move O -Dry Valley, ID to Don, ID (PHOS RK) - Local	0.000	0.000	3.317	3.32
Move P -Glencoe Jct., WY to Don, ID (CO) - Local	13.288	13.442	17.650	44.38

[107] *See, Investigation of Railroad Frt. Rate Structure — Coal*, 345 I.C.C. 71 (1974) (*Burden Study*).

[108] The composite (total) switching minutes were apportioned to the individual types of switching services based either on the agreement of the parties or a pro rata distribution reflecting the individual switching service relationships developed in the parties' evidence.

2. Summary of Operating Statistics

Table A-5 shows the operating statistics and traffic characteristics that are utilized in our restatement of variable costs for each movement at issue for the quarter in which that movement first took place,[109] except that the tare and lading weights are shown for each quarter.

Table A-5
Operating Statistics

Statistical Category	Car Type	Move A Westvaco, WY to Clearing, IL	Move B Westvaco, WY to Chicago, IL	Move C Westvaco, WY to Irondale, IL	Move D Westvaco, WY to Irondale, IL	Move E Westvaco, WY to Chicago, IL	Move F Westvaco, WY to Chicago, IL	Move G Westvaco, WY to Galt, IL	Move H Westvaco, WY to Lawrence, KS
Commodity		Soda Ash	Soda Ash	Soda Ash	Sodium Bi- & Sesqui-	Soda Ash - Interchange	Sodium Bi- & Sesqui- Interch.	Soda Ash	Soda Ash
Cars Per Train		102.60	102.60	102.60	102.60	102.60	102.60	99.50	108.40
Avg. Tare Wt.									
3rd QTR 1997	Priv.		32.50	30.42	32.00		31.78	31.11	31.31
	RR		32.50		31.00				
4th QTR 1997	Priv.	31.58		31.10	32.11		31.99	30.93	31.72
	RR								
1st QTR 1998	Priv.			31.44	31.83	31.74	32.32	31.13	31.10
	RR			31.23		32.15			32.55
2nd QTR 1998	Priv.			31.13	31.74	31.75	32.38	31.10	31.51
	RR					32.15			32.55
3rd QTR 1998	Priv.			31.81	32.47	31.58	32.42		32.82
	RR					32.15			
4th QTR 1998	Priv.			31.45	33.40	31.57	31.71		31.30
4th QTR 1998	RR					32.15			
Lading Weight									
3rd QTR 1997	Priv.		96.90	98.00	96.10		96.17	98.22	97.69
	RR		96.90		94.00				
4th QTR 1997	Priv.	99.00		98.43	97.38		95.84	99.44	98.34
	RR								
1st QTR 1998	Priv.			97.04	93.85	97.64	97.80	99.33	97.47
	RR			98.50		99.40			96.00
2nd QTR 1998	Priv.			94.52	97.41	97.05	97.78	99.00	97.75

[109] Comparable information for other quarters is contained in the electronic spreadsheets that we used to compute restated variable costs, and is available to the parties.

Statistical Category	Car Type	Move A Westvaco, WY to Clearing, IL	Move B Westvaco, WY to Chicago, IL	Move C Westvaco, WY to Irondale, IL	Move D Westvaco, WY to Irondale, IL	Move E Westvaco, WY to Chicago, IL	Move F Westvaco, WY to Chicago, IL	Move G Westvaco, WY to Galt, IL	Move H Westvaco, WY to Lawrence, KS
	RR					98.00			97.00
3rd QTR 1998	Priv.			97.18	96.11	96.94	94.79		97.71
	RR					101.00			
4th QTR 1998	Priv.			97.93	97.31	96.59	97.49		96.96
	RR					101.00			
Locos/ Unit Tr.		3.00636	3.00636	3.00636	3.00636	3.00636	3.00636	3.00636	3.00636
Locos/ Way Tr.		2.76	2.76	2.76	2.76	2.76	2.76	2.00	2.24
Locos/ Thru Tr.		2.97	2.97	2.97	2.97	2.97	2.97	2.80	3.04
Loco Unit Miles		7790.345	7790.345	7790.345	7790.345	7782.504	7778.287	6759.104	5489.893
LUM/Car		82.4029	82.2646	80.7190	81.3509	81.7449	81.0297	73.8526	61.4766
Gross Ton-Miles		213,724.278	213,365.723	209,356.972	210,995.797	212,016.821	210,161.307	195,063.647	146,391.693
Loaded Miles		1321.17	1321.17	1321.17	1321.17	1318.64	1318.88	1216.96	911.38
Empty Miles		1304.81	1304.81	1304.81	1304.81	1304.70	1303.04	1211.00	920.59
Round Trip Miles		2625.98	2625.98	2625.98	2625.98	2623.34	2621.92	2427.96	1831.97
Train ML/Car		27.7878	27.7412	27.2200	27.4331	27.5660	27.3248	26.6008	20.9524
Car Cycle Hours		Table A-2	Table A-2	Table A-2	Table A-2	Table A-2	Table A-2	Table A-2	Table A-2
Car Cycle Days		12.8375	12.8375	14.3875	26.0333	10.9500	13.7375	30.0708	17.0792
Loco Cycle Hrs.		Table A-3	Table A-3	Table A-3	Table A-3	Table A-3	Table A-3	Table A-3	Table A-3
Loco Cycle Days		4.3513	4.3513	4.3513	4.3513	4.3513	4.3513	2.7650	3.3208
Yard Switch-Min		Table A-4	Table A-4	Table A-4	Table A-4	Table A-4	Table A-4	Table A-4	Table A-4
Road Switch-Yd		Table A-4	Table A-4	Table A-4	Table A-4	Table A-4	Table A-4	Table A-4	Table A-4
Road Switch-Non		Table A-4	Table A-4	Table A-4	Table A-4	Table A-4	Table A-4	Table A-4	Table A-4

Statistical Category	Car Type	Move I Westvaco, WY to Kansas City, MO	Move J Westvaco, WY to Kansas City, MO	Move K Westvaco, WY to Portland, OR	Move L Don, ID to Westvaco, WY	Move M Don, ID to Lawrence, KS	Move N Don, ID to Chicago, IL	Move O Dry Valley, ID to Don, ID	Move P Glencoe Junction, WY to Don, ID
Commodity		(Soda Ash) - Export - Inter.	(Soda Ash) - Interchange	(Soda Ash) - Export	(Phosphorus) *	(Phosphorus) *	(Phosphorus) - Interch. *	(Phosphate Rock)	(Coke) **
Cars Per Train		100.50	107.10	95.90	62.00	91.20	92.00	81.40	68.95
Avg. Tare Weight									
3rd QTR 1997	Priv.				31.81	32.00	31.86		31.67
	RR				37.00	37.00	37.00	30.18	31.67
4th QTR 1997	Priv				32.35	32.25	32.24		31.05
	RR				37.83	37.81	37.82	30.13	31.05
1st QTR 1998	Priv.	31.55	31.07	31.59	32.35	32.15	32.43		31.10
	RR	31.83		31.61	37.90	37.80	37.97	30.22	31.10
2nd QTR 1998	Priv.	31.55	31.26	31.42	32.31	31.91	32.26		30.77
	RR	31.83		31.38	38.01	37.79	37.81	30.22	30.77
3rd QTR 1998	Priv.	31.55	32.86	31.18	32.32	31.87	32.32		30.81
	RR	31.83		31.50	38.01	37.84	38.05	30.18	30.81
4th QTR 1998	Priv.	31.55	31.51	31.40	32.42	31.97	32.07		30.83
	RR				37.84	37.83	37.80	30.23	30.83
Lading Weight									
3rd QTR 1997	Priv.				94.00	84.71	92.71		49.11
	RR				91.17	91.20	87.75	97.78	49.11
4th QTR 1997	Priv.				94.71	93.53	95.47		52.02
	RR				91.03	91.41	90.75	95.71	52.02
1st QTR 1998	Priv.	97.91	98.46	98.62	94.79	95.52	95.30		49.13
	RR	98.56		98.85	91.25	91.23	90.82	98.75	49.13
2nd QTR 1998	Priv.	97.79	97.55	98.37	95.11	95.78	95.20		51.98
	RR	97.75		97.99	91.28	91.21	90.92	98.26	51.98
3rd QTR 1998	Priv	97.92	95.71	98.39	94.87	95.64	95.00		51.58

Statistical Category	Car Type	Move I Westvaco, WY to Kansas City, MO	Move J Westvaco, WY to Kansas City, MO	Move K Westvaco, WY to Portland, OR	Move L Don, ID to Westvaco, WY	Move M Don, ID to Lawrence, KS	Move N Don, ID to Chicago, IL	Move O Dry Valley, ID to Don, ID	Move P Glencoe Junction, WY to Don, ID
	RR	99.00		100.00	91.12	91.00	91.05	98.15	51.58
4th QTR 1998	Priv.	98.43	97.45	97.93	94.52	95.13	94.93		48.71
	RR				91.00	91.05	91.02	98.54	48.71
Locos Per Unit Tr.		3.00636	3.00636	3.00636	3.00636	3.00636	3.00636	3.00636	3.00636
Locos Per Way Tr.		2.76	3.01	2.73	2.75	1.91	1.97	2.23	2.65
Locos Per Thru Tr.		2.85	2.86	3.50	3.13	3.03	3.03	4.00	3.13
Loco Unit Miles		5478.624	5465.752	6666.736	1526.223	6937.723	9410.674	795.520	1104.732
Loco Unit Mi. (Car)		58.9974	58.8170	65.4933	33.5270	121.0869	143.7452	9.7730	10.4501
Gross Ton-Miles		154,838.476	153,516.849	154,518.536	62,152.954	260,537.656	344,086.858	15,725.442	22,475.540
Loaded Miles		961.57	955.65	955.70	284.26	1180.58	1590.37	99.44	188.82
Empty Miles		962.08	956.92	952.10	270.73	1149.34	1533.56	99.44	228.06
Round Trip Miles		1923.65	1912.57	1907.80	554.99	2329.92	3123.93	198.88	416.88
Train Miles (Car)		20.7197	20.5863	18.7621	12.1916	42.4837	48.1740	2.4432	3.9434
Car Cycle Hours		Table A-2	Table A-2	Table A-2	XXX	XXX	XXX	Table A-2	Table A-2
Car Cycle Days		7.9625	11.8792	10.5042	XXX	XXX	XXX	3.4542	11.5542
Loco Cycle Hours		Table A-3	Table A-3	Table A-3	Table A-3	Table A-3	Table A-3	Table A-3	Table A-3
Loco Cycle Days		4.8696	3.3000	5.7733	1.5883	4.9463	5.9504	1.1713	1.5000
Yard Switch Min.		Table A-4	Table A-4	Table A-4	Table A-4	Table A-4	Table A-4	Table A-4	Table A-4
Road Switch (Yd)		Table A-4	Table A-4	Table A-4	Table A-4	Table A-4	Table A-4	Table A-4	Table A-4
Road Switch (Non)		Table A-4	Table A-4	Table A-4	Table A-4	Table A-4	Table A-4	Table A-4	Table A-4

* Phosphorus moves only in private cars. The "Priv" designation under car type reflects T-104 private tank cars. The "RR" designation under car type reflects T-644 private tank cars. Statistics, other than tare and lading weights, for phosphorus movements included in this table reflect data for T-644 tank cars.

** Coke moves only in railroad-owned cars. The "Priv" designation under car type reflects single car movements. The "RR" designation under car type reflects multiple-car movements.

C. Revenues

Revenues are determined by multiplying the tonnages moved under the challenged rate, plus or minus any appropriate adjustments. FMC asserts that private car rental payments and certain switching charges or allowances should be reflected as a revenue reduction prior to calculating the R/VC ratios for the issue movements.[110] We discuss these two issues here.

1. Private Car Rental Payments

FMC does not recognize as costs the expense that UP incurs for use of private cars. Rather, it subtracted UP's payments to the owners of private cars from movement revenues. UP points out, however, that car rental payments are included as costs in Schedule 410 of the R-1 and are routinely used to develop URCS variable costs.

We agree with UP that, when the railroad is responsible for supplying and/or paying for the car, the cost of supplying the car is properly incorporated into the movement's variable costs. Indeed, mileage allowance payments are appropriately recorded as an expense in the R-1 and have consistently been treated as variable costs in prior decisions.[111] FMC has not persuaded us that this longstanding treatment should be changed. Accordingly, private-car rental payments will continue to be treated as an expense and included in the development of variable costs.

2. Switching Charges at Chicago and Westvaco

UP does not directly serve any issue traffic destination in Chicago, but relies on terminal switching carriers to deliver FMC's traffic. At Westvaco, FMC performs terminal switching at its facility pursuant to an agreement under which UP pays FMC to perform the switching.

FMC would treat the payments made by UP for terminal switching at Chicago and Westvaco as deductions from UP's revenues. FMC argues that including these payments as a variable cost item is contrary to the way UP incorporates these payments into its R-1. FMC further contends that the treatment of switching charges as revenue adjustments comports with UP's treatment on its traffic tapes.

UP claims that the treatment of terminal switching charges as a revenue deduction is at odds with normal costing procedures. Although these items are not historically reflected in Schedule 410 of the R-1, UP submits that they are legitimate costs incurred by UP in providing service to its customers. UP cites three cases in which switch charges were included in the variable cost calculation of a rail movement.[112] UP points out that it is responsible for arranging for delivery of cars to its customers in Chicago and Westvaco, and argues that what it pays to accomplish final delivery or initial pickup therefore should be considered a cost.

We agree with UP that, because UP is ultimately responsible for supplying the switching service, the expenses it incurs to provide these services are legitimate costs and not adjustments to

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[110] Treatment of a given item as a revenue reduction, instead of an expense, increases the R/VC percentage, to the complainant's benefit.

[111] FMC acknowledges that prior precedent is contrary to its position, but argues that the precedent should be disregarded here.

[112] *Pielet Bros. Trading Co. v. CNW*, No. 39756 (ICC served August 11, 1987); *Cabot Corp. v. Southern Pac. Transp. Co.*, No. 40464 (ICC served December 18, 1990); *Petition of the Denver & R.G.W. R.R. & Salt Lake, G.&W. Ry. for Review of a Decision of the Public Serv. Comm'n of Utah Pursuant to 49 U.S.C. 11501*, No. 39060 (ICC served March 2, 1983).

revenues. FMC has presented no evidence to contradict UP's claim that UP is responsible for having the cars switched at origin or destination.

The rates for the issue O/D pairs are contained in Table A-6.

Table A-6
Rates for FMC Traffic

Move	Origin/Destination	Effect. Date	Rate Per Ton	Rate Increase Date	New Rate Per Ton	Rate 3100-I Item #
	Soda Ash from Westvaco, WY to:					
A	Clearing, IL	9/1/97	**$47.46**	1/1/99	**$47.93**	**3850**
B	Chicago, IL	9/1/97	**$47.46**	1/1/99	**$47.93**	**3850**
C	Irondale, IL	9/1/97	**$47.46**	1/1/99	**$47.93**	**3850**
E	Chicago, IL (interch.)	1/1/98	**$37.82**	1/1/99	**$38.20**	**3855**
G	Galt, IL	9/1/97	**$42.79**	1/1/99	**$43.22**	**3850**
H	Lawrence, KS	9/1/97	**$41.20**	1/1/99	**$41.61**	**3850**
I	Kansas City, MO (interch.) - Export	1/1/98	**$32.35**	1/1/99	**$32.67**	**3864**
J	Kansas City, MO (interch.)	1/1/98	**$35.95**	1/1/99	**$36.31**	**3875**
K	Portland, OR - Export	1/1/98	**$32.36**	XXX	**XXX**	**3840**
	Sodium Bicarbonate & Sesquicarbonate from Westvaco, WY to:					
D	Irondale, IL	9/1/97	**$49.00**	1/1/99	**$49.49**	**3870**
F	Chicago, IL (interch.)	9/1/97	**$39.27**	1/1/99	**$39.66**	**3870**
	Phosphorus from Don, ID to:					
L	Westvaco, WY	9/1/97	**$30.90**	1/1/99	**$31.21**	**2502**
M	Lawrence, KS	9/1/97	**$65.18**	1/1/99	**$65.83**	**2502**
N	Chicago, IL (interch.)	9/1/97	**$88.59**	1/1/99	**$89.48**	**2502**
	Phosphate Rock from Dry Valley, ID to:					
O	Don, ID	9/1/97	**$4.62**	1/1/99	**$4.71**	**2245**
	Coke from Glencoe Jct., WY to:					
P	Don, ID	9/1/97	**$15.23**	1/1/99	**$15.53**	**1850**

D. Variable Costs

Our discussion of variable costs focuses on two representative movements and discusses other O/D pairs only as necessary to resolve disputes between the parties. The first movement is a single-car sodium bicarbonate shipment that moved between Westvaco, WY and Irondale, IL during 4th Quarter 1997 in a shipper-owned car. The second is a trainload movement of phosphate rock from Dry Valley to Don, ID in 2nd Quarter 1998 in railroad-owned cars. Tables A-7 and A-8 show the parties' estimates[113] and our restatement of variable costs for the representative movements. (Our restated variable cost calculations for all issue O/D combinations and all time periods where traffic actually moved are found in Table A-13.) We discuss the component costs following Tables A-7 and A-8.

[113] The parties grouped certain expense categories associated with FMC's traffic differently. For example, FMC developed a separate expense category for locomotive fuel expense and, consequently, excluded fuel expense from the LUM, GTM and road switching expenses. UP, on the other hand, followed the standard procedures we have used in prior cases and included the fuel expense directly in LUM, GTM and road switching calculations.

In general, our policy is to standardize (simplify) the procedures used in these already very detailed and complex analyses. We will not accept modifications to standard procedures absent a compelling reason to do so. Here FMC has not explained the advantage to its non-standard expense grouping. We will continue to use the standard expense grouping used in prior cases because analysis of FMC's fragmented expense categories is problematic. However, to the extent possible, we have regrouped FMC's evidence for the two examples and placed FMC's data in the standard expense categories, for comparison with UP's data and our restatement.

Table A-7
Variable Cost Per Car - Sodium Bicarbonate
(Shipper Car - 4th Quarter 1997) - Single-Car Move

ITEM	FMC	UP	STB
1. Carloads O/T Clerical Expense	$36.59	$40.42	$40.43
2. Carload Handling - Other Expense	0.45	6.09	0.66
3. Switching - Yard Locomotives	21.17	36.15	26.92
4. Switching - Road Locomotives (Non-Yard)	2.50	17.39	2.22
5. Switching - Road Locomotives (Yard)	5.92	0.00	11.84
6. Gross Ton-Mile Expense	281.79	586.93	494.84
7. Train-Mile Expense - Other Than Crew	10.55	19.94	19.89
8. Train-Mile Expense - T & E Crew	135.68	178.85	178.36
9. Helper Service Expense - Excluding Crew	0.00	0.00	0.00
10. Helper Service Expense - Crew Expense	0.00	0.00	0.00
11. Locomotive Unit-Mile Expense *	122.92	201.07	199.43
12. Locomotive Ownership Expense	32.40	0.00	0.00
13. Private Line Car Rentals **	5.31	372.95	356.78
14. Car Operating Expense (RR-Owned Only)	0.00	0.00	0.00
15. Car Ownership Expense (RR-Owned Only)	0.00	0.00	0.00
16. Caboose & EOTD Ownership Expense	0.13	0.07	0.07
17. Switch Allowance and/or Switch Charge	0.00	366.46	366.46
18. Loss & Damage	0.00	2.05	2.04
19. Make-Whole Adjustment	12.93	350.48	350.55
20. Total Variable Cost/Carload	$668.34	$2,178.86	$2,050.50
21. Variable Cost Per Ton	$6.93	$22.27	$21.06
22. RFA-URCS Linking Factor	0.9934	0.9934	0.9934
23. Linked Variable Cost Per Ton	$6.89	$22.12	$20.92
24. Jurisd. Var. Cost Per Ton (Ln 23*180%)	**$12.40**	**$39.82**	**$37.67**
25. Rate Per Ton	$41.65	$49.00	$49.00
26. Revenue-to-Variable-Cost Percentage	604%	222%	234%

* UP used system-average costs for locomotive ownership costs for non-trainload traffic. For trainload traffic ownership cost is reflected separately on line 12 of this table.
** Includes user responsibility for repairs.

Table A-8
Variable Cost Per Car - Phosphate Rock
(Railroad Car - 2nd Quarter 1998) - Trainload Move

ITEM	FMC	UP	STB
1. Carloads O/T Clerical Expense	$27.57	$30.26	$30.75
2. Carload Handling - Other Expense	0.45	6.06	0.68
3. Switching - Yard Locomotives	0.00	0.00	0.00
4. Switching - Road Locomotives (Non-Yard)	1.96	3.35	1.50
5. Switching - Road Locomotives (Yard)	0.00	0.00	0.00
6. Gross Ton-Mile Expense	26.88	38.78	33.17
7. Train-Mile Expense - Other Than Crew	1.03	1.70	2.01
8. Train-Mile Expense - T & E Crew	37.56	42.31	45.42
9. Helper Service Expense - Excluding Crew	0.00	0.00	0.00
10. Helper Service Expense - Crew Expense	0.00	0.00	0.00
11. Locomotive Unit-Mile Expense *	11.00	15.86	17.31
12. Locomotive Ownership Expense	5.15	11.34	10.72
13. Private Line Car Rentals **	0.00	0.00	0.00
14. Car Operating Expense (RR-Owned Only)	4.52	16.77	8.11
15. Car Ownership Expense (RR-Owned Only)	23.42	83.62	41.52
16. Caboose & EOTD Ownership Expense	0.01	0.03	0.02
17. Switch Allowance and/or Switch Charge	0.00	0.00	0.00
18. Loss & Damage	0.00	0.57	0.63
19. Make-Whole Adjustment	0.00	0.00	0.00
20. Total Variable Cost/Carload	$139.54	$250.64	$191.94
21. Variable Cost Per Ton	$1.39	$2.55	$1.95
22. RFA-URCS Linking Factor	0.9934	0.9934	0.9934
23. Linked Variable Cost Per Ton	$1.38	$2.53	$1.94
24. Jurisd. Variable Cost Per Ton (Ln 23*180%)	$2.48	$4.55	3.49
25. Rate Per Ton	$4.62	$4.62	$4.62
26. Revenue-to-Variable-Cost Percentage	335%	183%	238%

* UP used system-average costs for locomotive ownership costs for non-trainload traffic. For trainload traffic ownership cost is reflected separately on line 12 of this table.
** Includes user responsibility for repairs.

1. Carloads Originated or Terminated Clerical Expense

Because the parties used different URCS applications, they disagree on the per-carload system-average unit cost for this category. As previously noted, our restatement uses the unadjusted 1997 URCS (October 27, 1998 run) for 1997 movements and the 1998 URCS (October 5, 1999 run) for 1998 movements.

2. Carload Handling - Other Expense

FMC contends that its issue traffic does not require the use of equipment or services related to the cleaning of car interiors, car loading devices or grain doors. It therefore applied an adjustment factor (10.826%) to 1997 traffic to exclude expenses associated with such equipment services. UP disagrees, contending that such expenses are associated with FMC's traffic because UP continually checks covered hopper car doors and cleans up soda ash leaks.

The costs associated with checking hopper doors and cleaning up leaks do not relate to the cleaning of car interiors, grain doors or car loading devices. Therefore, we find that FMC's adjustment properly excludes identifiable portions of the unit cost that does not specifically pertain to movement of any issue commodities, and we use FMC's adjustment factor to develop our restated carload handling expense for the 1997 issue movements. For 1998 movements, we calculate an adjustment factor of 14.003%.

3. Switching - Yard Locomotives

See, Table A-4, *supra.*

4. Switching - Road Locomotives (Non-Yard)

See, Table A-4, *supra.*

5. Switching - Road Locomotives (Yard)

See, Table A-4, *supra.*

6. Gross Ton-Mile Expenses

a. Maintenance-of-Way Expense

To calculate the variable MOW cost for the movements at issue, FMC used the Speed Factored Gross Ton (SFGT) formula, which has been accepted in numerous prior cases.[114] The SFGT formula

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[114] *See, e.g., Arizona I; Nevada Power II; West Texas; Georgia Power.* SFGT combines separately calculated unit (per route-mile) costs for roadway, ties, rail and other track materials, and ballast and surfacing, taking into account such factors as number of tracks, type and respective speed of traffic (unit train, heavy wheel load and other freight, and passenger, if applicable), rail curvature, amount of continuous welded rail, and Federal Railroad Administration (FRA) safety classification.

determines variable MOW costs by subtracting fixed MOW costs[115] from total MOW costs. FMC computed MOW costs for each line segment both with and without traffic. These two values were then subtracted, yielding the variable MOW cost per line segment. Individual line-segment MOW values were summed for the entire route and divided by the total traffic to yield an average variable MOW cost per million gross ton-miles (MGTM). Finally, FMC indexed its variable MOW cost per MGTM to develop a 1997 variable MOW. Table A-9 shows FMC's results after it revised its SFGT calculation on rebuttal to use: UP's track and traffic data; UP's URCS data to compute the R-factor; and UP's loaded-mile figures.

Table A-9
FMC's Variable MOW Costs

Move	Route	$/MGTM
A-D	Westvaco-Chicago (Proviso)	$ 189.06
E, F	Westvaco-Chicago (Ashland)	189.05
G	Westvaco-Galt	188.22
H	Westvaco-Lawrence	180.99
I, J	Westvaco-Kansas City	185.00
K	Westvaco-Portland	203.85
L	Don-Westvaco	202.21
M	Don-Lawrence	183.37
N	Don-Chicago (Ashland)	190.08
O	Dry Valley-Don	223.13
P	Glencoe Jct-Don	208.28

UP used the Weighted System Average Cost (WSAC) approach, which was used in *Amtrak*.[116] The WSAC formula seeks to determine the relative damage attributable to the subject traffic. UP developed the relationship between WSAC results for the issue route and the entire UP system.[117] It calculated an engineering adjustment factor (EAF),[118] which was applied to the URCS system-

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[115] Fixed MOW costs are those that are independent of traffic levels and therefore would be incurred even if no traffic moves. For example, climatic conditions cause track assets such as ties to deteriorate.

[116] *Nat'l RR Passenger Corp., et al. — Applic. — Just Comp.,* 10 I.C.C. 2d 863 (1995) (*Amtrak*). The WSAC costing procedure used there: (1) determined aggregate total maintenance costs over all lines traversed by Amtrak and divided by all GTMs, yielding the average maintenance costs per GTM; (2) determined damage factors for six types of traffic on each line segment; (3) determined the variability factor for each line segment based on WSAC; and (4) multiplied the average maintenance cost per GTM by the damage factor for passenger traffic and the variability factor.

[117] UP used detailed input data for curves, continuous welded rail, rail weight and grade, tonnage and speed. For the remaining inputs to WSAC (rail hardness, lubrication, and passenger axle load), UP used the values adopted by the ICC in *Amtrak*.

[118] An EAF was computed to allocate system-average maintenance costs in a manner proportional to the damage to the track structure. For example, if the EAF is equal to one, the (continued...)

average operating and depreciation costs to develop MOW costs associated with the FMC traffic. Table A-10 shows UP's results.

Table A-10
UP's Variable MOW Costs

Move	Route	$/MGTM
A	Westvaco-Chicago (Clearing)	$ 369.88
B	Westvaco-Chicago	369.88
C	Westvaco-Chicago (Irondale)	369.88
D	Westvaco-Chicago (Irondale)	369.88
E	Westvaco-Chicago (IF)	369.81
F	Westvaco-Chicago (IF)	369.85
G	Westvaco-Galt	369.74
H	Westvaco-Lawrence	369.67
I	Westvaco-Kansas City	381.99
J	Westvaco-Kansas City	370.02
K	Westvaco-Portland	466.43
L	Don-Westvaco	351.05
M	Don-Lawrence	324.01
N	Don-Chicago (IF to CR)	323.59
O	Dry Valley-Don	402.83
P	Glencoe Jct-Don	285.08

FMC objects to use of WSAC here. FMC notes that WSAC was used in *Amtrak* to calculate incremental *passenger* costs. FMC also notes that in *Amtrak* WSAC was accepted in preference to a modified SFGT formula submitted, not the traditional SFGT formula used by FMC here.

UP has not shown that WSAC is an appropriate tool for developing variable MOW costs for freight traffic.[119] Indeed, UP has not explained why WSAC shows variable MOW unit costs to be linear with density while UP's R-1 data show decreasing unit costs as density increases (as does SFGT).

Although we use the SFGT methodology for estimating variable MOW costs, we do not accept FMC's operating and depreciation expenses incorporated into its SFGT calculations because they are based on inappropriate URCS applications. Variable MOW and depreciation costs per GTM, developed from the unadjusted 1997 and 1998 URCS, have been used instead. The results of our application of the SFGT methodology are shown in Table A-11.

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[118](...continued)
anticipated damage to a line segment by the subject traffic is the same as the system-average. If the EAF is greater than one, then the expected damage is greater than that inflicted under system-average conditions and the MOW costs associated with the issue traffic would be correspondingly higher.

[119] While WSAC evidence was submitted in *Georgia Power*, use of WSAC was rejected in favor of the SFGT formula.

Table A-11
Road Track MOW
Operating and Depreciation Unit-Costs (Per GTM)

Move	1997 Oper. Exp.	1997 Deprec. Exp.	1998 Oper. Exp.	1998 Deprec. Exp.
Move A- Westvaco, WY to Clearing, IL	$0.00018269	$0.00013969	$0.00018341	$0.00013959
Move B- Westvaco, WY to Chicago, IL	0.00018269	0.0001397	0.00018341	0.00013959
Move C- Westvaco, WY to Irondale, IL	0.00018269	0.0001397	0.00018341	0.00013959
Move D- Westvaco, WY to Irondale, IL	0.00018269	0.0001397	0.00018341	0.00013959
Move E- Westvaco, WY to Chicago, IL	0.00018268	0.0001397	0.00018339	0.00013959
Move F- Westvaco, WY to Chicago, IL	0.00018268	0.0001397	0.00018339	0.00013959
Move G- Westvaco, WY to Galt, IL	0.00018187	0.0001397	0.00018259	0.00013959
Move H- Westvaco, WY to Lawrence, KS	0.00017489	0.0001411	0.00017557	0.00014101
Move I- Westvaco, WY to Kan. City, MO	0.00017876	0.0001411	0.00017946	0.00014101
Move J- Westvaco, WY to Kan. City, MO	0.00017876	0.0001411	0.00017946	0.00014101
Move K- Westvaco, WY to Portland, OR	0.00019698	0.0002153	0.00019775	0.00021800
Move L- Don, ID to Westvaco, WY	0.00019539	0.0001699	0.00019616	0.00017088
Move — Don, ID to Lawrence, KS	0.00017718	0.0001441	0.00017788	0.00014414
Move N– Don, ID to Chicago, IL	0.00018367	0.0001427	0.00018439	0.00014272
Move O- Dry Valley, ID to Don, ID	0.00021561	0.000194	0.00021646	0.00019590
Move P- Glencoe Jct., WY to Don, ID	0.00020126	0.000187	0.00020205	0.00018879

b. Fuel, Locomotive Maintenance and Other GTM Expenses

The parties used differing URCS and service units to develop their estimates for these categories of expenses. In addition, as noted, UP used the standard grouping of expenses accepted in prior SAC cases, while FMC used a different grouping. As noted previously, our restatement begins with the 1997 and 1998 unadjusted URCS and the standard grouping of expenses used in prior cases. Furthermore, we adjust the URCS system-average costs for the service units and the indexing procedures discussed elsewhere in this Appendix.

c. Depreciation and ROI – Road Property

FMC based its calculation of depreciation and return on investment (ROI) expenses for each FMC movement on the line-segment-specific gross investment data provided by UP in discovery.[120] FMC developed an adjustment to system-average costs by comparing UP's actual gross investment for FMC routes (on a per-GTM basis) to a system-average investment (on a per-GTM basis) modified to exclude a portion of the CNW acquisition premium (modified URCS). In a similar vein, FMC adjusted road property investment costs by comparing UP's actual investment (by valuation section and property account) to system-wide investment from the modified URCS, which reflected significant modifications to the road property investment section of the STB-published data.[121] UP claims that FMC's approach understates the gross investment allocable to its traffic.

As previously noted, FMC's modified URCS is unacceptable and adjustments to exclude the effects of properly applied purchase accounting rules are also inappropriate. Therefore, we reject FMC's evidence and use UP's evidence, which is based on system-average URCS costs.

7. Train-Mile Expense – Other than Crew

This expense category includes expenses for road operations, train inspection and other miscellaneous train-mile expenses. The parties disagree on the train-miles per car to be applied to the unit costs. As noted previously, we have accepted UP's route mileages. Accordingly, our restatement incorporates UP's train-miles.

8. Train-Mile Expense - Train and Engine Crew

This item reflects the expenses incurred for train and engine (T&E) crew wages and pay supplements. FMC submitted a special study based on a crew wage data base provided by UP in discovery. Asserting that the data base contained "non-train-related" expenses, FMC identified trains (by train symbol) that carry its traffic and calculated a mark-up factor of 1.068 to reflect holiday and vacation pay records included in the data base that UP provided.

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[120] FMC properly excluded investment contained in valuation sections numbered "99," "00," and "blank." UP created these valuation sections for investments that have not yet been assigned to a specific valuation section. UP presented no evidence that any of the investment in these general categories would eventually be assigned to valuation segments used by FMC's traffic.

[121] As UP points out, FMC's adjustment for road property investment costs mixed UP's reported investments in the numerator with FMC's modified URCS in the denominator, producing a meaningless result.

UP states that vacation and holiday pay, as well as significant other items, are typically not assigned to a specific train symbol and that FMC's analysis is therefore invalid. To account for otherwise unassigned expenses, UP developed a mark-up factor using its entire wage data base. It compared the full wages paid by UP to all T&E crews during 1997 to the total amount of labor expense paid for running trains. UP's approach yielded mark-up factors of 1.26 for engineers, 1.234 for conductors and 1.337 for brakemen, and UP applied these factors to FMC's analysis.

FMC's attempted distinction between "train-related" and "non-train-related" expenses is not relevant when determining the total variable cost of train operations. Non-train-related expenses include costs for deadheading, engineer guarantee, held-away-from-home terminal, drug and alcohol testing, personal leave, various meals and lodgings, and FRA engineer certification — expenses that, while not associated with any particular train, are associated with overall train operations. These expenses are properly included in this expense category and we thus generally accept UP's evidence.[122]

9. Helper Service Expense – Excluding Crew

Helper service[123] only applies to export movements of soda ash to Portland. The parties generally agree on the methodology used for determining this category of variable expense. The results differ because of their use of different URCS time periods. As noted, our restatement uses the unadjusted UP 1997 and 1998 URCS.

10. Helper Service Expense – Crew Expense

As discussed above, we accept UP's methodology and determination of movement-specific crew wages, including its calculation of the mark-up ratio for T&E. We therefore apply UP's mark-up ratios to the helper service associated with export movements of soda ash.

11. Locomotive Unit-Mile Expense

The parties' differences on this expense result from the use of different URCS. Our restatement of this expense is based on the 1997 and 1998 URCS.

12. Locomotive Ownership Expense

The parties used URCS system-average locomotive ownership costs for single-car and multiple-car movements, and individual locomotive costs for trainload movements. We have restated the parties' single-car and multiple-car evidence to reflect our use of the unadjusted 1997 and 1998 UP URCS.

Individual data for trainload traffic were developed from URCS, UP's locomotive cycle times, and depreciation rates. UP determined a depreciation rate of 4.32% that is associated with the

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[122] UP's analysis reflects a net mark-up ratio of 1.1628 for all issue traffic except the Westvaco, WY to Galt, IL movement, which shows a net mark-up ratio of 1.2208. UP failed to explain its basis for this change, and the unexplained adjustment is thus rejected.

[123] Helper service involves the use of additional locomotives when operating circumstances necessitate (*e.g.*, the adding of a locomotive to pull a train up a steep grade).

locomotives used to serve FMC traffic. FMC's presentation utilized a system-average depreciation rate of 4.30%.

Our restatement uses the unadjusted 1997 and 1998 URCS, UP's previously accepted locomotive cycle times, and UP's depreciation rate that reflects the depreciation rate on the specific locomotives used to serve FMC.

13. Private-Car Rentals

a. Mileage Rates

As discussed above, we reject FMC's treatment of private-car mileage allowances as revenue reductions. Accordingly, mileage rates are appropriately included in the variable cost determinations.

b. Car Repairs – User

In *Car Service Compensation — Basic Per Diem Charges*, 358 I.C.C. 715 (1977), car repair costs associated with shipper-provided cars were found to constitute 9.51% of the total cost of repairing all cars. Both parties acknowledge the applicability of this apportionment ratio. The parties disagree, however, as to how unit costs should be computed. (UP divided total car repair expenses by only railroad-owned freight car-miles, while FMC divided total car repair expenses by total freight car miles.) UP's procedure impermissibly develops unit costs by dividing apples (railroad-owned and private car repair expense) by oranges (railroad-owned car miles). By inappropriately limiting the size of the divisor, UP devised an inflated unit cost. We accept FMC's evidence that appropriately includes private- and railroad-owned-car data in both the numerator and denominator when developing unit costs.

14. Car Operating Expense (Railroad-Owned Only)

The parties' differences on this expense result from their use of different URCS time periods and service units. As discussed above, our restatement relies on the unadjusted 1997 and 1998 URCS and the appropriate service units for each issue movement.

15. Car Ownership Expense (Railroad-Owned Only)

The parties' cost figures on this item differ because of the use of different URCS, car cycle times, car values (original costs) and depreciation rates. We use unadjusted 1997 and 1998 URCS, FMC's (previously accepted) car cycle times, and UP's original costs and depreciation rates.

We use UP's original costs and depreciation rates for the phosphate rock and coke traffic because UP's original weighted average costs are lower than FMC's costs for these two commodities and because FMC incorrectly used the most current depreciation rates (3rd Quarter 1998) for all quarters up through 4th Quarter 1998. With respect to soda ash and sodium bicarbonate and sesquicarbonate, FMC grouped all cars moving these commodities into a single category and developed a single weighted average original cost. UP, on the other hand, developed individual original costs for the cars used for each of the specific O/D movements at issue. We use UP's approach for this traffic because it is more specific and detailed than FMC's approach. In addition, FMC's presentation for soda ash and sodium bicarbonate and sesquicarbonate traffic contained the same depreciation rate deficiency.

16. End-Of-Train-Device & Caboose Ownership Expense

The parties developed end-of-train-device (EOTD) costs based on an investment cost of $3,421 and the URCS that each used.[124] We restate the EOTD costs based on an investment of $3,421 and the unadjusted 1997 and 1998 URCS.

UP included caboose costs for coke movements from Glencoe Junction to Don. In the absence of a reply from FMC on this matter, we accept UP's inclusion of this cost. (The impact is minimal, resulting in a total caboose variable cost of less than $0.01 per car for the movement.)

17. Switch Allowance and/or Switch Charge

As discussed above, FMC's proposed treatment of switching allowances and charges at Chicago and Westvaco as revenue reductions is rejected. There is no dispute over the amount of these expenditures, and we have accordingly included the agreed upon expenditures in the variable cost determinations.

With regard to expenses associated with the soda dome in Portland, UP assigned per-car costs for its investment and monthly costs associated with use of the dome and its surrounding trackage. FMC contends that these expenses are already captured in UP's R-1 as joint-facility costs and thus are already reflected in URCS variable costs. UP correctly points out that these expenses were not recorded in the R-1 as joint-facility costs. Thus, there is no double-count and the payments are expenses properly associated with FMC's export soda ash traffic. We therefore accept UP's inclusion of these expenses.

18. Loss & Damage Expense

FMC did not include any loss and damage (L&D) expense. However, UP identified four L&D claims involving FMC traffic that were processed in 1997 and 1998. We accept UP's evidence and rely on UP's unadjusted 1997 and 1998 URCS system-average data to calculate the L&D expense for each issue movement.[125]

19. Make-Whole Adjustments

The make-whole adjustment was developed because the URCS waybill costing procedure adjusts trainload and multiple-car shipment costs to recognize the efficiency of these types of

[124] FMC also included variable costs for a head-of-train-device (HOTD). However, we reject this cost because FMC did not show that UP uses HOTDs when serving FMC's traffic.

[125] The system-average L&D unit-costs are as follows:

	1997 Per Ton Cost	1998 *Per Ton Cost*
Soda Ash	$0.02088	$0.02398994
Sodium Bicarbonate	0.02088	0.02398994
Sodium Sesquicarbonate	0.02088	0.02398994
Phosphorus	0.01576	0.01490411
Phosphate Rock	0.00581626	0.00642624
Coke	0.01593	0.02721973

shipments. Because trainload and multiple-car shipments move at less-than-system-average cost, the cost savings generated by these types of shipments must be redistributed to lower-volume shipments to ensure that all system costs are accounted for (made whole) when the individual shipments are totaled. The make-whole factors for each Class I carrier are published annually in our Manual Make-Whole Data Sheet.

UP applied data from *Data Sheet-1997* against the appropriate service units for each make-whole category to develop base-year total make-whole costs for single-car and multiple-car movements for the applicable O/D pair.

FMC attempted to adjust the figures contained in *Data Sheet-1997*. However, the make-whole factors are not subject to adjustment. Each make-whole adjustment factor is made up of a conglomeration of expenses associated with the movement of trainload and multiple-car shipments. They are developed by collecting the total dollar savings that result from application of the *Burden Study* to trainload and multiple-car traffic and dividing those dollar amounts by the railroad's total corresponding operating statistics. Unlike URCS unit costs, the detail required to break apart each make-whole factor is simply not available. Therefore, our restatement of variable costs relies on UP's standard application of make-whole factors.

20. Indexing

The final step in determining variable costs is to index base-year variable costs to the various issue quarters.[126] It is difficult to make meaningful comparisons of the parties' indexes because they grouped expenses differently and because FMC used two different URCS base years.

We find generally that UP's indexing procedures are more appropriate. UP's index procedure showed expenses separately for wage and wage supplements, whereas FMC combined the two categories. UP's procedure is more detailed and facilitates the application of the separate indexes used to adjust separate expense categories of wages and wage supplements. However, UP incorrectly indexed the "other indexable expenses" category. *Section 229 Complaints* prescribes the use of the producer price index (PPI) to index this category unless an acceptable alternative is presented in a particular case. Because UP has failed to justify its deviation from this standard, we use the PPI to index these expenses.

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[126] *See, Explanation of Rail Cost Update Procedures*, ICC Statement 1E3-80 (April 1980), as supplemented in *Complaints Filed — §229 — Staggers Rail Act of 1980*, 365 I.C.C. 507 (1980) (*Section 229 Complaints*).

Our index restatement for the various expense categories yields the following:

Table A-12
STB INDEXES[127]

Quarter	Crew Wages	Fuel	Composite	Make-Whole
3rd 1997	1.00691	0.91381	1.00115	0.99289
4th 1997	1.00748	0.98676	1.00258	1.00153
1st 1998	1.02964	1.07188	1.00379	1.00945
2nd 1998	1.02827	1.01413	1.00209	1.00333
3rd 1998	1.01283	0.95203	0.99876	0.99441
4th 1998	1.01396	0.96196	0.99548	0.9929

21. Summary of Variable Costs

Based on our restatement of the variable cost categories discussed above, we have developed total variable costs by quarter for the various O/D pairs. Table A-13 summarizes our restated variable costs by component and our composite variable-cost-per-ton amounts for each O/D combination in quarters where traffic actually moved. The table also contains actual rates, R/VC ratios and jurisdictional threshold information (in bold) for the issue traffic.

[127] The base year expenses used for 3rd and 4th Quarter 1997 are contained in UP's 1997 R-1 report, whereas the base-year expenses for 1998 are predicated on UP's 1998 R-1.

Table A-13

STB Restated

Individual-Movement R/VC Ratios, Issue Rates and Jurisdictional Thresholds (3rd Quarter 1997 through 4th Quarter 1998)												
MOVEMENT	B	B	C	D	D	F	G	H	L	L	M	M
Commodity	SA	SA	SA	SB	SB	SB	SA	SA	PHOS	PHOS	PHOS	PHOS
Quarter	3rd 97	3rd 97	3rd 97	3rd 97	3rd 97	3rd 97	3rd 97	3rd 97	3rd 97	3rd 97	3rd 97	3rd 97
Car Type	Priv.	*RR*	Priv.	Priv.	*RR*	Priv.	Priv.	Priv.	T-104	T-644	T-104	T-644
Carload-Cler.	$40.38	$40.38	$40.38	$40.38	$40.38	$20.18	$40.38	$40.38	$40.38	$40.38	$40.38	$40.38
Carload- Hdl	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66
Switch-Yard	26.82	26.82	26.82	26.82	26.82	26.82	80.44	45.78	77.42	77.42	96.47	96.47
Sw-Rd (No-Yd)	2.17	2.17	2.17	2.17	2.17	2.19	10.07	16.10	10.67	10.67	21.10	21.10
Sw-Rd (Yard)	11.78	11.78	11.78	11.78	11.78	17.66	5.36	10.71	10.70	10.70	10.91	10.91
GTM	489.65	489.65	480.43	484.21	471.80	482.30	447.46	334.84	140.64	145.51	553.17	597.45
Train Mile-Oth	19.90	19.90	19.53	19.67	19.17	19.61	19.09	15.04	8.46	8.75	28.22	30.48
Tr. Mile-Crew	169.75	169.75	173.56	176.60	172.09	166.91	187.65	157.29	180.93	187.18	288.30	311.38
Helper-Exc. Cr.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Helper-Crew	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
LUM	194.41	194.41	190.77	192.26	187.33	191.50	174.54	145.28	76.59	79.23	264.96	286.17
Loco Own.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Priv. Line Rent	668.31	0.00	668.31	668.31	0.00	667.16	608.95	482.06	194.76	234.03	901.70	1122.67
Car Operating	0.00	86.67	0.00	0.00	116.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Car Ownership	0.00	92.93	0.00	0.00	98.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cab. & EOTD	0.07	0.07	0.07	0.07	0.07	0.07	0.04	0.05	0.04	0.04	0.08	0.08
Switch Allow.	214.67	214.67	363.20	363.20	363.20	99.26	97.80	97.80	97.80	97.80	0.00	0.00
L&D	2.03	2.03	2.05	2.01	1.96	2.01	2.05	2.04	1.48	1.44	1.34	1.44
Make-Wh. Adj.	347.53	347.53	347.53	347.53	347.53	251.56	337.99	309.28	247.76	247.76	333.27	333.27
Total VC/ Carload	$2,188.12	$1,699.41	$2,327.25	$2,335.67	$1,859.45	$1,947.88	$2,012.48	$1,657.30	$1,088.29	$1,141.56	$2,540.57	$2,852.47
VC Per Ton	$22.58	$17.54	$23.75	$24.30	$19.78	$20.25	$20.49	$16.96	$11.58	$12.52	$29.99	$31.28
RFA-URCS Link	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934
Linked VC/Ton	$22.43	$17.42	$23.59	$24.14	$19.65	$20.12	$20.35	$16.85	$11.50	$12.44	$29.79	$31.07
180%* VC	$40.37	$31.36	$42.46	$43.45	$35.37	$36.22	$36.63	$30.33	$20.70	$22.39	$53.62	$55.93
Rate Per Ton	$47.46	$47.46	$47.46	$49.00	$49.00	$39.27	$42.79	$41.20	$30.90	$30.90	$65.18	$65.18
R/VC Pct.	212%	272%	201%	203%	249%	195%	210%	245%	269%	248%	219%	210%

Individual-Movement R/VC Ratios, Issue Rates and Jurisdictional Thresholds
(3rd Quarter 1997 through 4th Quarter 1998)

MOVEMENT	N	N	O	P	P	A	C	D	F	G	H	L
Commodity	PHOS	PHOS	PHRK	CO	CO	SA	SA	SB	SB	SA	SA	PHOS
Quarter	3rd 97	3rd 97	3rd 97	3rd 97	3rd 97	4th 97	4th 97	4th 97	4th 97	4th 97	4th 97	4th 97
Car Type	T-104	T-644	*RR*	*RR-Sing.*	*RR-Mult.*	Priv.	Priv.	Priv.	Priv.	Priv.	Priv.	T-104
Carload- Cler	$20.18	$20.18	$30.40	$40.38	$31.64	$40.43	$40.43	$40.43	$20.21	$40.43	$40.43	$40.43
Carload- Hand	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66
Switch-Yard	85.94	85.94	0.00	65.25	65.25	26.92	26.92	26.92	26.92	80.76	45.96	77.73
Sw-Rd (No-Yd)	7.73	7.73	1.38	9.57	9.57	2.22	2.22	2.22	2.24	10.33	16.51	10.94
Sw-Rd (Yard)	14.26	14.26	0.00	39.53	39.53	11.84	11.84	11.84	17.74	5.39	10.77	10.76
GTM	772.33	791.11	33.17	53.18	53.18	496.57	491.92	494.84	488.47	455.47	342.14	143.57
Train Mile-Oth	33.74	34.56	1.75	2.83	2.83	19.96	19.78	19.89	19.64	19.22	15.19	8.53
Train Mile-Cr	313.94	321.59	42.57	66.34	66.34	170.13	175.61	178.36	167.08	188.76	158.82	182.55
Helper-Ex Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Helper-Crew	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
LUM	331.64	339.72	16.73	24.70	24.70	200.13	198.25	199.43	196.85	180.32	150.67	79.36
Loco Ownersh	0.00	0.00	11.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Priv Line Rent	1217.91	1529.03	0.00	0.00	0.00	626.31	652.39	356.78	386.44	614.29	477.06	193.47
Car Operating	0.00	0.00	10.92	30.77	30.77	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Car Ownership	0.00	0.00	45.22	62.64	62.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cab. & EOTD	0.11	0.11	0.03	0.03	0.03	0.07	0.07	0.07	0.07	0.04	0.05	0.04
Switch Allow	0.00	0.00	0.00	0.00	0.00	217.12	366.46	366.46	97.80	97.80	97.80	97.80
L&D	1.46	1.38	0.57	0.78	0.78	2.07	2.06	2.04	2.01	2.08	2.06	1.50
Make-Wh Adj.	275.75	275.75	0.00	241.10	20.08	350.55	350.55	350.55	253.74	340.93	311.97	249.91
Total VC/ Car	$3,075.67	$3,422.04	$194.56	$637.75	$407.99	$2,164.99	$2,339.16	$2,050.50	$1,679.88	$2,036.48	$1,670.10	$1,097.25
VC Per Ton	$33.18	$39.00	$1.99	$12.99	$8.31	$21.87	$23.76	$21.06	$17.53	$20.48	$16.98	$11.59
RFA-URCS Link	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934
Linked VC/Ton	$32.96	$38.74	$1.98	$12.90	$8.26	$21.73	$23.60	$20.92	$17.41	$20.34	$16.87	$11.51
180%* VC	**$59.33**	**$69.73**	**$3.56**	**$23.22**	**$14.87**	**$39.11**	**$42.48**	**$37.66**	**$31.34**	**$36.61**	**$30.37**	**$20.72**
Rate Per Ton	$88.59	$88.59	$4.62	$15.23	$15.23	$47.46	$47.46	$49.00	$39.27	$42.79	$41.20	$30.90
R/VC Pct.	269%	229%	233%	118%	184%	218%	201%	234%	226%	210%	244%	268%

Individual-Movement R/VC Ratios, Issue Rates and Jurisdictional Thresholds
(3rd Quarter 1997 through 4th Quarter 1998)

MOVEMENT	L	M	M	N	N	O	P	P	C	C	D	E
Commodity	PHOS	PHOS	PHOS	PHOS	PHOS	PHRK	CO	CO	SA	SA	SB	SA
Quarter	4th 97	4th 97	4th 97	4th 97	4th 97	4th 97	4th 97	4th 97	1st 98	1st 98	1st 98	1st 98
Car Type	T-644	T-104	T-644	T-104	T-644	*RR*	*RR-Sing.*	*RR-Mult.*	Priv.	*RR*	Priv.	Priv.
Carload Cler	$40.43	$40.43	$40.43	$20.21	$20.21	$30.46	$40.43	$31.68	$40.90	$40.90	$40.90	$20.46
Carload Hand	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.68	0.68	0.68	0.68
Switch-Yard	77.73	96.85	96.85	86.28	86.28	0.00	65.51	65.51	23.67	23.67	23.67	23.67
Sw-Rd (No-Yd)	10.94	21.66	21.66	7.93	7.93	1.42	9.82	9.82	2.64	2.64	2.64	2.64
Sw-Rd (Yard)	10.76	10.97	10.97	14.34	14.34	0.00	39.73	39.73	10.99	10.99	10.99	16.50
GTM	148.28	585.60	609.86	794.92	818.03	33.17	54.51	54.51	498.88	502.15	491.33	501.83
Train Mile-Oth	8.82	29.55	30.78	34.35	35.35	1.83	2.87	2.87	23.22	23.37	22.87	23.35
Tr Mile-Crew	188.56	301.61	314.11	319.34	328.62	44.51	67.23	67.23	191.69	192.94	190.61	187.04
Helper-Ex. Crw	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Helper-Crew	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
LUM	81.97	284.70	296.50	346.47	356.54	18.19	25.70	25.70	217.10	218.51	213.80	218.37
Loco Owner	0.00	0.00	0.00	0.00	0.00	11.70	0.00	0.00	0.00	0.00	0.00	0.00
Priv. Line Rent	233.25	900.46	1120.19	1212.85	1525.66	0.00	0.00	0.00	715.23	0.00	442.68	712.36
Car Operating	0.00	0.00	0.00	0.00	0.00	10.94	30.81	30.81	0.00	106.42	0.00	0.00
Car Ownership	0.00	0.00	0.00	0.00	0.00	44.47	61.54	61.54	0.00	51.82	0.00	0.00
Cab. & EOTD	0.04	0.08	0.08	0.11	0.11	0.03	0.03	0.03	0.06	0.06	0.06	0.06
Switch Allow.	97.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	365.19	365.19	365.19	114.71
L&D	1.44	1.48	1.44	1.51	1.43	0.56	0.83	0.83	2.34	2.37	2.26	2.35
Make-Wh. Adj.	249.91	336.17	336.17	278.15	278.15	0.00	243.20	20.26	327.56	327.56	327.56	233.61
Total VC/Per Carload	$1,150.60	$2,610.21	$2,879.71	$3,117.13	$3,473.32	$197.93	$642.87	$411.18	$2,420.16	$1,869.28	$2,135.25	$2,057.63
VC Per Ton	$12.64	$27.91	$31.50	$32.65	$38.27	$2.07	$12.36	$7.90	$24.94	$18.98	$22.75	$21.07
RFA-URCS Link	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934
Linked VC-Per Ton	$12.56	$27.73	$31.29	$32.43	$38.02	$2.06	$12.28	$7.85	$24.78	$18.85	$22.60	$20.93
180%* VC	**$22.61**	**$49.91**	**$56.32**	**$58.37**	**$68.44**	**$3.71**	**$22.10**	**$14.13**	**$44.60**	**$33.93**	**$40.68**	**$37.67**
Rate Per Ton	$30.90	$65.18	$65.18	$88.59	$88.59	$4.62	$15.23	$15.23	$47.46	$47.46	$49.00	$37.82
R/VC Pct.	246%	235%	208%	273%	233%	224%	124%	194%	192%	252%	217%	181%

Individual-Movement R/VC Ratios, Issue Rates and Jurisdictional Thresholds
(3rd Quarter 1997 through 4th Quarter 1998)

MOVEMENT	E	F	G	H	H	I	I	J	K	K	L	L
Commodity	SA	SB	SA	SA	SA	SA	SA	SA	SA	SA	PHOS	(PHOS)
Quarter	1st 98	1st 98	1st 98	1st 98	1st 98	1st 98	1st 98	1st 98	1st 98	1st 98	1st 98	1st 98
Car Type	RR	Priv.	Priv.	Priv.	RR	Priv.	RR	Priv.	Priv.	RR	T-104	T-644
Carload Clerical	$20.46	$20.46	$40.90	$40.90	$40.90	$15.41	$15.41	$20.46	$30.78	$30.78	$40.90	$40.90
Carload Handling	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68
Switch-Yard	23.67	23.67	70.98	40.39	40.39	7.89	7.89	23.67	29.35	29.35	68.32	68.32
Switch-Rd (No-Yd)	2.64	2.64	12.32	19.70	19.70	1.85	1.85	2.64	1.85	1.85	13.07	13.07
Switch-Road (Yard)	16.50	16.50	5.00	10.00	10.00	12.09	12.09	22.01	3.59	3.59	9.99	9.99
GTM	509.88	505.59	464.83	343.93	347.04	312.30	314.65	362.86	327.68	328.22	146.40	151.40
Train Mile-Other	23.72	23.53	22.70	17.68	17.84	17.55	17.55	17.44	15.89	15.89	10.07	10.42
Train Mile-Crew	190.04	186.22	207.35	171.87	173.41	169.20	169.24	157.12	118.93	147.70	200.23	207.08
Helper-Excl Crew	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.44	6.44	0.00	0.00
Helper-Crew	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.60	7.60	0.00	0.00
LUM	221.88	220.01	198.70	163.57	165.04	107.12	107.15	157.12	147.70	118.93	87.35	90.31
Loco Ownership	0.00	0.00	0.00	0.00	0.00	45.42	45.42	0.00	81.44	81.44	0.00	0.00
Private Line Rent	0.00	325.97	656.06	495.52	0.00	522.78	0.00	510.85	513.04	0.00	203.40	244.19
Car Operating	97.08	0.00	0.00	0.00	93.55	0.00	71.08	0.00	0.00	77.52	0.00	0.00
Car Ownership	66.57	0.00	0.00	0.00	122.39	0.00	43.17	0.00	0.00	61.99	0.00	0.00
Caboose & EOTD	0.06	0.06	0.04	0.04	0.04	0.07	0.07	0.04	0.09	0.09	0.04	0.04
Switch Allowance	114.71	96.53	96.53	96.53	96.53	96.53	96.53	96.53	117.06	117.06	96.53	96.53
L&D	2.39	2.36	2.39	2.35	2.31	2.36	2.37	2.37	2.37	2.38	1.42	1.37
Make-Whole Adjust.	233.61	233.48	318.72	292.10	292.10	0.00	0.00	201.87	0.00	0.00	235.07	235.07
Total VC/ Carload	$1,523.89	$1,657.70	$2,097.21	$1,695.27	$1,421.93	$1,311.26	$905.15	$1,575.65	$1,404.50	$1,031.52	$1,113.47	$1,169.39
VC Per Ton	$15.33	$16.95	$21.11	$17.39	$14.81	$13.39	$9.18	$16.00	$14.24	$10.44	$11.75	$12.82
RFA-URCS Link	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934
Linked VC-Per Ton	$15.23	$16.84	$20.97	$17.28	$14.71	$13.30	$9.12	$15.89	$14.15	$10.37	$11.67	$12.74
180%* VC	**$27.41**	**$30.31**	**$37.75**	**$31.10**	**$26.48**	**$23.94**	**$16.42**	**$28.60**	**$25.47**	**$18.67**	**$21.01**	**$22.93**
Rate Per Ton	$37.82	$39.27	$42.79	$41.20	$41.20	$32.35	$32.35	$35.95	$32.36	$32.36	$30.90	$30.90
Rate to VC Ratio	248%	233%	204%	238%	280%	243%	355%	226%	229%	312%	265%	243%

Individual-Movement R/VC Ratios, Issue Rates and Jurisdictional Thresholds
(3rd Quarter 1997 through 4th Quarter 1998)

MOVEMENT	M	M	N	N	O	P	P	C	D	E	E	F
Commodity	PHOS	PHOS	PHOS	PHOS	PH RK	CO	CO	SA	SB	SA	SA	(SB)
Quarter	1st 98	1st 98	1st 98	1st 98	1st 98	1st 98	1st 98	2nd 98	2nd 98	2nd 98	2nd 98	2nd Q 98
Car Type	T-104	T-644	T-104	T-644	*RR*	*RR-Sing.*	*RR-Mult.*	Priv.	Priv.	Priv.	*RR*	Priv.
Carload Clerical	$40.90	$40.90	$20.46	$20.46	$30.80	$40.90	$32.05	$40.84	$40.84	$20.42	$20.42	$20.42
Carload Handling	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68
Switch-Yard	85.13	85.13	75.84	75.84	0.00	57.59	57.59	23.59	23.59	23.59	23.59	23.59
Switch-Rd (No-Yd)	25.83	25.83	9.48	9.48	1.53	11.70	11.70	2.60	2.60	2.60	2.60	2.60
Switch-Road (Yard)	10.21	10.21	13.32	13.32	0.00	36.92	36.92	10.95	10.95	16.43	16.43	16.43
GTM	601.51	620.66	810.61	834.76	33.57	54.31	54.31	485.15	497.87	496.25	501.66	501.38
Train Mile-Other	35.12	36.25	40.55	41.76	1.99	3.30	3.30	22.72	23.31	23.24	23.49	23.48
Train Mile-Crew	333.48	344.10	350.47	360.91	44.68	72.01	72.01	187.67	194.46	186.17	188.19	186.09
Helper-Excl Crew	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Helper-Crew	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
LUM	315.77	325.84	381.47	392.83	17.22	27.63	27.63	209.20	214.69	213.99	216.33	216.21
Loco Ownership	0.00	0.00	0.00	0.00	10.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Private Line Rent	928.96	1171.46	1298.56	1591.98	0.00	0.00	0.00	704.67	432.13	718.75	0.00	408.22
Car Operating	0.00	0.00	0.00	0.00	8.12	23.15	23.15	0.00	0.00	0.00	96.93	0.00
Car Ownership	0.00	0.00	0.00	0.00	42.28	58.67	58.67	0.00	0.00	0.00	66.52	0.00
Caboose & EOTD	0.08	0.08	0.10	0.10	0.02	0.03	0.03	0.06	0.06	0.06	0.06	0.06
Switch Allowance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	365.19	365.19	115.42	115.42	108.49
L&D	1.43	1.36	1.43	1.36	0.64	1.34	1.34	2.27	2.34	2.33	2.36	2.35
Make-Whole Adjust.	314.34	314.34	255.97	255.97	0.00	228.90	18.62	325.58	325.58	232.22	232.22	231.96
Total VC/ Carload	$2,693.45	$2,976.86	$3,258.93	$3,599.44	$191.96	$617.13	$398.00	$2,381.17	$2,134.28	$2,052.16	$1,506.91	$1,741.96
VC Per Ton	$28.20	$32.63	$34.20	$39.63	$1.94	$12.56	$8.10	$25.19	$21.91	$21.15	$15.38	$17.82
RFA-URCS Link	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934
Linked VC-Per Ton	$28.01	$32.41	$33.97	$39.37	$1.93	$12.48	$8.05	$25.02	$21.77	$21.01	$15.28	$17.70
180%* VC	**$50.42**	**$58.34**	**$61.15**	**$70.87**	**$3.47**	**$22.46**	**$14.49**	**$45.04**	**$39.19**	**$37.81**	**$27.50**	**$31.86**
Rate Per Ton	$65.18	$65.18	$88.59	$88.59	$4.62	$15.23	$15.23	$47.46	$49.00	$37.82	$37.82	$39.27
Rate to VC Ratio	233%	201%	261%	225%	239%	122%	189%	190%	225%	180%	248%	222%

Individual-Movement R/VC Ratios, Issue Rates and Jurisdictional Thresholds
(3rd Quarter 1997 through 4th Quarter 1998)

MOVEMENT	G	H	H	I	I	J	K	K	L	L	M	M
Commodity	SA	SA	SA	SA	SA	SA	SA	SA	PHOS	PHOS	PHOS	(PHOS)
Quarter	2nd 98	2nd 98	2nd 98	2nd 98	2nd 98	2nd 98	2nd 98	2nd 98	2nd 98	2nd 98	2nd 98	2nd Q 98
Car Type	Priv.	Priv.	RR	Priv.	RR	Priv.	Priv.	RR	T-104	T-644	T-104	T-644
Carload Clerical	$40.84	$40.84	$40.84	$15.38	$15.38	$20.42	$30.74	$30.74	$40.84	$40.84	$40.84	$40.84
Carload Handling	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68
Switch-Yard	70.76	40.26	40.26	7.86	7.86	23.59	29.26	29.26	68.10	68.10	84.86	84.86
Switch-Rd (No-Yd)	12.13	19.40	19.40	1.81	1.81	2.60	1.81	1.81	12.86	12.86	25.43	25.43
Switch-Road (Yard)	4.98	9.96	9.96	12.04	12.04	21.92	3.58	3.58	9.95	9.95	10.17	10.17
GTM	459.98	343.52	346.38	309.17	310.17	358.75	322.90	321.98	145.40	150.36	596.07	615.55
Train Mile-Other	22.61	17.77	17.92	17.52	17.52	17.36	17.51	17.51	10.06	10.41	35.03	36.19
Train Mile-Crew	206.57	172.82	174.26	168.98	169.00	156.40	162.78	162.76	200.19	207.04	332.71	343.58
Helper-Excl Crew	0.00	0.00	0.00	0.00	0.00	0.00	6.99	6.99	0.00	0.00	0.00	0.00
Helper-Crew	0.00	0.00	0.00	0.00	0.00	0.00	8.41	8.41	0.00	0.00	0.00	0.00
LUM	194.86	161.90	163.25	104.49	104.50	153.95	127.40	127.40	85.93	88.87	310.10	320.22
Loco Ownership	0.00	0.00	0.00	45.38	45.38	0.00	89.73	89.73	0.00	0.00	0.00	0.00
Private Line Rent	603.35	484.08	0.00	522.77	0.00	513.01	520.06	0.00	204.20	245.27	962.48	1177.91
Car Operating	0.00	0.00	93.39	0.00	70.96	0.00	0.00	77.38	0.00	0.00	0.00	0.00
Car Ownership	0.00	0.00	122.31	0.00	43.13	0.00	0.00	65.21	0.00	0.00	0.00	0.00
Caboose & EOTD	0.04	0.04	0.04	0.07	0.07	0.04	0.10	0.10	0.04	0.04	0.08	0.08
Switch Allowance	96.53	96.53	96.53	96.53	96.53	96.53	117.06	117.06	96.53	96.53	0.00	0.00
L&D	2.38	2.35	2.33	2.35	2.35	2.35	2.36	2.36	1.42	1.36	1.43	1.36
Make-Whole Adjust.	316.79	290.33	290.33	0.00	0.00	200.64	0.00	0.00	233.65	233.65	312.44	312.44
Total VC/ Carlad	$2,032.49	$1,680.48	$1,417.89	$1,305.04	$897.38	$1,568.26	$1,441.38	$1,062.96	$1,109.85	$1,165.95	$2,712.31	$2,969.31
VC Per Ton	$20.53	$17.19	$14.62	$13.35	$9.18	$16.08	$14.65	$10.85	$11.67	$12.77	$28.32	$32.55
RFA-URCS Link	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934
Linked VC-Per Ton	$20.39	$17.08	$14.52	$13.26	$9.12	$15.97	$14.55	$10.78	$11.59	$12.69	$28.13	$32.34
180%* VC	**$36.70**	**$30.74**	**$26.14**	**$23.87**	**$16.42**	**$28.75**	**$26.19**	**$19.40**	**$20.86**	**$22.84**	**$50.63**	**$58.21**
Rate Per Ton	$42.79	$41.20	$41.20	$32.35	$32.35	$35.95	$32.36	$32.36	$30.90	$30.90	$65.18	$65.18
Rate to VC Ratio	210%	241%	284%	244%	355%	225%	222%	300%	267%	243%	232%	202%

Individual-Movement R/VC Ratios, Issue Rates and Jurisdictional Thresholds
(3rd Quarter 1997 through 4th Quarter 1998)

MOVEMENT	N	N	O	P	P	C	D	E	E	F	H	I
Commodity	PHOS	PHOS	PH RK	CO	CO	SA	SB	SA	SA	SB	SA	(SA)
Quarter	2nd 98	2nd 98	2nd 98	2nd 98	2nd 98	3rd 98	3rd 98	3rd 98	3rd 98	3rd 98	3rd 98	3rd 98
Car Type	T-104	T-644	*RR*	*RR-Sgl*	*RR-Mlt*	Priv.	Priv.	Priv.	*RR*	Priv.	Priv.	Priv.
Carload Clerical	$20.42	$20.42	$30.75	$40.84	$32.00	$40.70	$40.70	$20.35	$20.35	$20.35	$40.70	$15.33
Carload Handling	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68
Switch-Yard	75.60	75.60	0.00	57.40	57.40	23.49	23.49	23.49	23.49	23.49	40.09	7.83
Switch-Rd (No-Yd)	9.32	9.32	1.50	11.51	11.51	2.56	2.56	2.56	2.56	2.56	19.05	1.77
Switch-Road (Yard)	13.27	13.27	0.00	36.77	36.77	10.89	10.89	16.36	16.36	16.36	9.92	11.98
GTM	802.48	827.27	33.17	54.87	54.87	492.93	493.68	489.87	505.78	487.74	345.77	306.11
Train Mile-Other	40.40	41.64	2.01	3.36	3.36	23.22	23.26	23.07	23.82	22.98	18.00	17.46
Train Mile-Crew	349.30	360.08	45.42	73.21	73.21	189.60	191.71	182.80	188.73	180.01	172.96	166.44
Helper-Excl Crew	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Helper-Crew	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
LUM	374.23	385.78	17.31	27.64	27.64	210.40	210.71	209.08	215.88	208.18	161.31	101.57
Loco Ownership	0.00	0.00	10.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	45.35
Private Line Rent	1284.48	1604.26	0.00	0.00	0.00	728.74	590.21	736.04	0.00	370.66	496.52	522.75
Car Operating	0.00	0.00	8.11	23.11	23.11	0.00	0.00	0.00	96.58	0.00	0.00	0.00
Car Ownership	0.00	0.00	41.52	57.56	57.56	0.00	0.00	0.00	67.63	0.00	0.00	0.00
Caboose & EOTD	0.10	0.10	0.02	0.03	0.03	0.06	0.06	0.06	0.06	0.06	0.04	0.07
Switch Allowance	0.00	0.00	0.00	0.00	0.00	365.19	365.19	113.11	113.11	110.96	96.53	96.53
L&D	1.42	1.36	0.63	1.42	1.42	2.33	2.30	2.32	2.42	2.27	2.34	2.35
Make-Whole Adjust.	254.42	254.42	0.00	227.51	18.51	322.68	322.68	230.12	230.12	229.88	287.75	0.00
Total VC/ Carload	$3,226.12	$3,594.19	$191.84	$615.92	$398.07	$2,413.47	$2,278.13	$2,049.91	$1,507.56	$1,676.18	$1,691.65	$1,296.22
VC Per Ton	$33.89	$39.53	$1.95	$11.85	$7.66	$24.84	$23.70	$21.15	$14.93	$17.68	$17.31	$13.24
RFA-URCS Link	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934
Linked VC-Per Ton	$33.67	$39.27	$1.94	$11.77	$7.61	$24.68	$23.54	$21.01	$14.83	$17.56	$17.20	$13.15
180%* VC	**$60.61**	**$70.69**	**$3.49**	**$21.19**	**$13.70**	**$44.42**	**$42.37**	**$37.82**	**$26.69**	**$31.61**	**$30.96**	**$23.67**
Rate Per Ton	$88.59	$88.59	$4.62	$15.23	$15.23	$47.46	$49.00	$37.82	$37.82	$39.27	$41.20	$32.35
Rate to VC Ratio	263%	226%	238%	129%	200%	192%	208%	180%	255%	224%	240%	246%

Individual-Movement R/VC Ratios, Issue Rates and Jurisdictional Thresholds
(3rd Quarter 1997 through 4th Quarter 1998)

MOVEMENT	I	J	K	K	L	L	M	M	N	N	O	P
Commodity	SA	SA	SA	SA	PHOS	PHOS	PHOS	PHOS	PHOS	PHOS	PH RK	CO
Quarter	3rd 98	3rd 98	3rd 98	3rd 98	3rd 98	3rd 98	3rd 98	3rd 98	3rd 98	3rd 98	3rd 98	3rd 98
Car Type	*RR*	Priv.	Priv.	*RR*	T-104	T-644	T-104	T-644	T-104	T-644	*RR*	*RR-Sgl*
Carload Clerical	$15.33	$20.35	$30.63	$30.63	$40.70	$40.70	$40.70	$40.70	$20.35	$20.35	$30.65	$40.70
Carload Handling	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68
Switch-Yard	7.83	23.49	29.14	29.14	67.81	67.81	84.50	84.50	75.27	75.27	0.00	57.16
Switch-Rd (No-Yd)	1.77	2.56	1.77	1.77	12.63	12.63	24.96	24.96	9.16	9.16	1.46	11.31
Switch-Road (Yard)	11.98	21.82	3.56	3.56	9.91	9.91	10.13	10.13	13.21	13.21	0.00	36.60
GTM	309.24	358.42	319.05	323.53	143.90	148.87	589.90	609.49	794.67	821.76	32.79	54.20
Train Mile-Other	17.47	17.44	16.66	16.66	10.02	10.37	34.89	36.04	40.25	41.62	2.07	3.34
Train Mile-Crew	166.49	155.36	153.42	153.44	196.99	203.78	327.38	338.25	343.93	355.65	46.11	71.93
Helper-Excl Crew	0.00	0.00	6.51	6.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Helper-Crew	0.00	0.00	7.90	7.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
LUM	101.60	152.25	119.27	119.27	84.19	87.09	303.76	313.85	366.82	379.31	17.57	27.03
Loco Ownership	45.35	0.00	86.00	86.00	0.00	0.00	0.00	0.00	0.00	0.00	11.21	0.00
Private Line Rent	0.00	491.21	519.54	0.00	202.86	245.81	954.72	1179.18	1286.22	1607.75	0.00	0.00
Car Operating	70.72	0.00	0.00	77.03	0.00	0.00	0.00	0.00	0.00	0.00	8.08	23.03
Car Ownership	44.27	0.00	0.00	66.35	0.00	0.00	0.00	0.00	0.00	0.00	45.45	63.83
Caboose & EOTD	0.07	0.04	0.09	0.09	0.04	0.04	0.08	0.08	0.10	0.10	0.03	0.03
Switch Allowance	96.53	96.53	117.06	117.06	96.53	96.53	0.00	0.00	0.00	0.00	0.00	0.00
L&D	2.37	2.29	2.36	2.40	1.41	1.36	1.42	1.35	1.41	1.36	0.63	1.40
Make-Whole Adjust.	0.00	198.86	0.00	0.00	231.57	231.57	309.66	309.66	252.16	252.16	0.00	225.49
Total VC/ Carload	$891.70	$1,541.30	$1,413.64	$1,042.03	$1,099.24	$1,157.15	$2,682.77	$2,948.87	$3,204.22	$3,578.37	$196.74	$616.74
VC Per Ton	$9.01	$16.10	$14.37	$10.42	$11.59	$12.70	$28.05	$32.41	$33.73	$39.30	$2.00	$11.96
RFA-URCS Link	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934
Linked VC-Per Ton	$8.95	$15.99	$14.28	$10.35	$11.51	$12.62	$27.86	$32.20	$33.51	$39.04	$1.99	$11.88
180%* VC	**$16.11**	**$28.78**	**$25.70**	**$18.63**	**$20.72**	**$22.72**	**$50.15**	**$57.96**	**$60.32**	**$70.27**	**$3.58**	**$21.38**
Rate Per Ton	$32.35	$35.95	$32.36	$32.36	$30.90	$30.90	$65.18	$65.18	$88.59	$88.59	$4.62	$15.23
Rate to VC Ratio	361%	225%	227%	313%	268%	245%	234%	202%	264%	227%	232%	128%

Individual-Movement R/VC Ratios, Issue Rates and Jurisdictional Thresholds
(3rd Quarter 1997 through 4th Quarter 1998)

MOVEMENT	P	C	D	E	E	F	H	I	J	K	L	L
Commodity	CO	SA	SB	SA	SA	SB	SA	SA	SA	SA	PHOS	PHOS
Quarter	3rd 98	4th 98	4th 98	4th 98	4th 98	4th 98	4th 98	4th 98	4th 98	4th 98	4th 98	4th 98
Car Type	*RR-Mlt.*	Priv.	Priv.	Priv.	*RR*	Priv.	Priv.	Priv.	Priv.	Priv.	T-104	T-644
Carload Clerical	$31.89	$40.57	$40.57	$20.29	$20.29	$20.29	$40.57	$15.28	$20.29	$30.53	$40.57	$40.57
Carload Handling	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68
Switch-Yard	57.16	23.45	23.45	23.45	23.45	23.45	40.02	7.82	23.45	29.09	67.69	67.69
Switch-Rd (No-Yd)	11.31	2.56	2.56	2.56	2.56	2.56	19.06	1.77	2.56	1.77	12.64	12.64
Switch-Road (Yard)	36.60	10.89	10.89	16.35	16.35	16.35	9.92	11.98	21.81	3.56	9.91	9.91
GTM	54.20	492.99	503.01	488.84	505.91	491.82	337.71	307.16	356.24	319.02	143.79	148.54
Train Mile-Other	3.34	23.15	23.61	22.97	23.76	23.10	17.51	17.40	17.27	16.60	9.98	10.31
Train Mile-Crew	71.93	189.85	195.57	182.60	188.98	181.66	169.13	166.64	154.61	153.59	197.06	203.59
Helper-Excl Crew	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.53	0.00	0.00
Helper-Crew	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.91	0.00	0.00
LUM	27.03	210.64	214.93	208.88	216.17	210.17	157.72	101.83	151.48	119.56	84.21	87.00
Loco Ownership	0.00	0.00	0.00	0.00	0.00	0.00	0.00	45.29	0.00	85.90	0.00	0.00
Private Line Rent	0.00	713.67	706.14	740.87	0.00	477.37	483.01	522.74	509.72	519.53	201.24	246.60
Car Operating	23.03	0.00	0.00	0.00	96.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Car Ownership	63.83	0.00	0.00	0.00	67.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Caboose & EOTD	0.03	0.06	0.06	0.06	0.06	0.06	0.04	0.07	0.04	0.09	0.04	0.04
Switch Allowance	0.00	365.19	365.19	114.15	114.15	112.65	96.53	96.53	96.53	117.06	96.53	96.53
L&D	1.40	2.34	2.32	2.31	2.41	2.33	2.32	2.35	2.33	2.34	1.40	1.35
Make-Whole Adjust.	18.34	322.19	322.19	229.78	229.78	229.58	287.31	0.00	198.56	0.00	231.22	231.22
Total VC/ Carload	$400.78	$2,398.24	$2,411.16	$2,053.80	$1,508.36	$1,792.07	$1,661.53	$1,297.53	$1,555.57	$1,413.75	$1,096.94	$1,156.67
VC Per Ton	$7.77	$24.49	$24.78	$21.26	$14.93	$18.38	$17.14	$13.18	$15.96	$14.44	$11.61	$12.71
RFA-URCS Link	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934
Linked VC-Per Ton	$7.72	$24.33	$24.62	$21.12	$14.83	$18.26	$17.03	$13.09	$15.85	$14.34	$11.53	$12.63
180%* VC	**$13.90**	**$43.79**	**$44.32**	**$38.02**	**$26.69**	**$32.87**	**$30.65**	**$23.56**	**$28.53**	**$25.81**	**$20.75**	**$22.73**
Rate Per Ton	$15.23	$47.46	$49.00	$37.82	$37.82	$39.27	$41.20	$32.35	$35.95	$32.36	$30.90	$30.90
Rate to VC Ratio	197%	195%	199%	179%	255%	215%	242%	247%	227%	226%	268%	245%

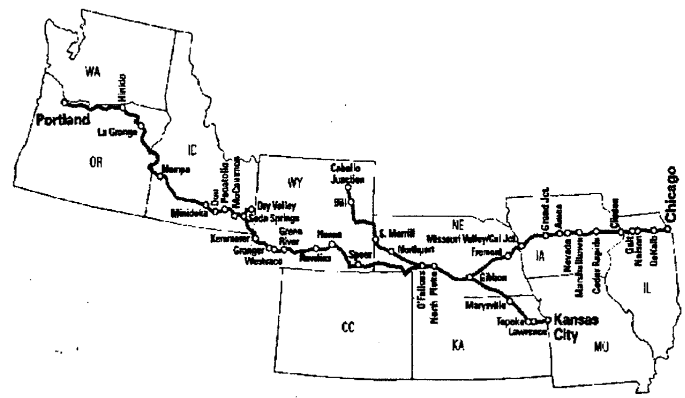
Individual-Movement R/VC Ratios, Issue Rates and Jurisdictional Thresholds
(3rd Quarter 1997 through 4th Quarter 1998)

MOVEMENT	M	M	N	N	O	P	P
Commodity	PHOS	PHOS	PHOS	PHOS	PH RK	CO	CO
Quarter	4th 98	4th 98	4th 98	4th 98	4th 98	4th 98	4th 98
Car Type	T-104	T-644	T-104	T-644	*RR*	*RR-Sing.*	*RR-Mult.*
Carload Clerical	$40.57	$40.57	$20.29	$20.29	$30.55	$40.57	$31.79
Carload Handling	0.68	0.68	0.68	0.68	0.68	0.68	0.68
Switch-Yard	84.36	84.36	75.14	75.14	0.00	57.06	57.06
Switch-Rd (No-Yd)	24.98	24.98	9.16	9.16	1.46	11.31	11.31
Switch-Road (Yard)	10.12	10.12	13.20	13.20	0.00	36.59	36.59
GTM	588.97	609.50	792.52	819.75	32.89	52.91	52.91
Train Mile-Other	34.72	35.93	40.01	41.38	2.02	3.25	3.25
Train Mile-Crew	327.27	338.67	343.41	355.20	45.17	70.31	70.31
Helper-Excl Crew	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Helper-Crew	0.00	0.00	0.00	0.00	0.00	0.00	0.00
LUM	303.62	314.21	366.22	378.80	17.21	26.43	26.43
Loco Ownership	0.00	0.00	0.00	0.00	10.95	0.00	0.00
Private Line Rent	949.55	1184.33	1324.86	1613.01	0.00	0.00	0.00
Car Operating	0.00	0.00	0.00	0.00	8.05	22.96	22.96
Car Ownership	0.00	0.00	0.00	0.00	44.77	62.84	62.84
Caboose & EOTD	0.08	0.08	0.10	0.10	0.02	0.03	0.03
Switch Allowance	0.00	0.00	0.00	0.00	0.00	0.00	0.00
L&D	1.41	1.35	1.41	1.35	0.63	1.32	1.32
Make-Whole Adjust.	309.19	309.19	251.77	251.77	0.00	225.15	18.31
Total VC/ Carload	$2,675.51	$2,953.95	$3,238.78	$3,579.83	$194.40	$611.41	$395.79
VC Per Ton	$28.12	$32.44	$34.12	$39.33	$1.97	$12.55	$8.13
RFA-URCS Link	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934	0.9934
Linked VC-Per Ton	$27.93	$32.23	$33.89	$39.07	$1.96	$12.47	$8.08
180%* VC	$50.27	$58.01	$61.00	$70.33	$3.53	$22.45	$14.54
Rate Per Ton	$65.18	$65.18	$88.59	$88.59	$4.62	$15.23	$15.23
Rate to VC Ratio	233%	202%	261%	227%	236%	122%	188%

APPENDIX B — ORR CONFIGURATION

FMC designed the ORR to be a trunk and branch line rail system handling traffic moving through Oregon, Idaho, Wyoming, Colorado, Nebraska, Kansas, Iowa and Illinois. The ORR would extend over 2,500 miles from Portland, OR to Chicago, IL and Kansas City, KS, with a 375-mile extension into the Powder River Basin coal field (from O'Fallons, NE to Caballo Jct., WY). The following map shows the ORR system.

OVERLAND RAILROAD
SYSTEM MAP



UP claims that some additional branch lines and industrial spurs would be necessary to serve the traffic included in the group. UP also contends that FMC has failed to include sufficient multiple main line, maintenance and yard tracks, given the volume of traffic FMC assumes would use the ORR during the 20-year SAC analysis period.[128] As discussed below, we agree that some additional route and track miles would be needed, but we find that the mileage would be less than what UP asserts. **Table B-1** shows the parties' estimates and our findings on the route and track miles that would be needed by the ORR.

Table B-1
ORR Route And Track Miles

Route Miles	FMC[129]	UP[130]	STB
Main Line Route Miles	2256.52	2256.52	2256.52
Branch Line Route Miles[131]	774.93	790.09	781.37
Industrial Track Miles	65.69	87	71.6
Track Miles			
Main Line & Branch Lines			
Single Track	1110.72	1099.57[132]	1075.45
Double Track	1815.06	1840.58	1840.58
Triple Track	171.37	180.86	180.86
Quadruple Track	0	12.6	12.6
Bad Order/MOW/Service & Repair Track	0	54.78	54.78
Yard Track	256.82	593.59	593.59
Total Track Miles	**5,511.77**	**6,022.08**	**5,997.96**

[128] The SAC constraint does not require that all investment be in place when the stand-alone railroad would initiate service. However, assets must be in place when they would be needed. In this case, FMC designed the ORR with enough initial capacity to handle the projected traffic growth over the entire analysis period.

[129] FMC Electronic Workpapers Pattison, Mainqty-r.wk4.

[130] UP Reply Electronic Workpapers McDonald/Webb, Trkmiles.wk4 and HDR Yards.xls.

[131] UP correctly points out that FMC miscalculated the branch-line route mileage in its opening evidence by 0.16 mile. FMC's spreadsheet (Bran_mil.xls) shows that the Marysville Subdivision is actually 286.18 miles, and the track charts contained in both parties' workpapers shows that the distance from Moyer Jct. to the Skull Point mine (Cumberland Industrial Lead) is 10.21 miles.

[132] Includes 87 miles of industrial track not included in UP's electronic spreadsheets.

A. Route Miles

1. Additional Branch Lines

UP argues that the ORR route proposed by FMC in its opening evidence would need approximately 86 additional miles of branch lines, involving 31 locations. FMC agrees that approximately 68 additional miles of branch lines, involving 27 of the 31 locations, should be included.[133] Table B-2 shows the branch lines on which the parties could not agree and our findings.

Table B-2

Disputed Branch Lines (miles)					
Subdivision	**From**	**To**	**UP**	**FMC**	**STB**
KCT (to Neff Yd.)	Kan. City, KS (18th St.)	Kan. City, MO (Neff Yd.)	8.47	---	8.47
Geneva	Kedzie, IL	Chicago, IL (Clinton St.)	3.2	---	---
Kenosha	Chicago, IL (Clinton St.)	Clybourn, IL	2.60	---	---
Milwaukee	Proviso, IL	Elk Grove, IL	8	7.5	7.5
Fairfax Lead	Fairfax, KS	Fairfax, KS (Minn. Ave.)	1	---	---
KCT (to 18th St)	Fairfax, KS (Minn. Ave.)	KCT Sub MP 2.2	1.42	---	---

a. KCT (to Neff Yard)

UP claims that FMC must add 8.47 miles of track, including a bridge extending from the 18th St. Yard in Kansas City, KS across the Missouri River to the Neff Yard in Kansas City, MO, in order to complete certain soda ash movements covered by the complaint and to interchange other traffic included in the ORR traffic group. UP interchanges this traffic with the Norfolk Southern Railway (NS) and the Kansas City Southern Railway (KCS) in Kansas City, MO, where UP also maintains an intermodal facility. FMC contends that it would not be necessary for ORR track to extend into Missouri because the ORR could use the services and facilities of the Kansas City Terminal Railway (KCT) to complete the soda ash movements and to effectuate the interchange of the non-issue traffic.[134] FMC would locate the ORR intermodal facility in Kansas and terminate the ORR system there.

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[133] We work from UP's mileage figures rather than FMC's because FMC's evidence has conflicting mileage figures for the additional branch lines. *See,* FMC Reb. Electronic Workpapers Pattison, Mainqty-r.wk4 and Burris, TRAKREV.wk4.

[134] As FMC notes, UP's Witness Salzman testified at his October 28, 1998, deposition that UP has used this alternative. FMC Reb. V.S. Burris at 20.

Under SAC principles, FMC may interchange traffic at any feasible location, so long as it includes all associated costs.[135] Here, because FMC has not included the cost of having KCT provide this service, we will include in the ORR the bridge and 8.47 miles of track needed for the ORR to reach the Neff Yard in Missouri.

b. Other Branch Lines

UP argues that nearly 17 miles of other UP branch lines on which the parties could not agree should not have been excluded from the ORR system. On rebuttal, FMC acknowledges that 7.5 miles of the 8-mile Proviso-to-Elk Grove segment would need to be included, because some of the ORR traffic group uses that track. FMC maintains that the other branch lines (totaling 8.72 miles) were properly excluded, however, because none of the traffic included in the ORR traffic group—selected from UP waybill files based on standard point location codes (SPLCs)—moves to or from SPLCs associated with those branch lines.

UP has presented no evidence that the ORR traffic group would need the additional lines. Thus, we find that the total length of the additional branch lines that should be included in the ORR system would be 76.79 miles (UP's 85.51 additional miles minus the 8.72 miles over which no ORR traffic would move).

2. Additional Industrial Track

UP argues that FMC has omitted 87 miles of industrial track that the ORR would need. FMC agrees that some industrial track must be added, but claims UP's workpapers supports only 71.6 miles.[136] FMC also argues that 5.9 miles of this track were included in its opening evidence, leaving only 65.7 miles that would need to be added. However, we have found no evidence that FMC included this track in its track investment.[137]

Neither party has adequately supported its evidence on this issue. There are no references to track charts, waybill data or workpapers that permit us to determine which party has the better position. In the absence of any probative evidence, we add only the 71.6 miles of industrial track on which there is agreement.

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[135] *See, McCarty* at 468 (assumption that a substitute service would provide the transportation is acceptable "so long as the costs for providing the substitute service are included in the SAC").

[136] FMC claims that the remaining 15.4 miles of track are not identified in UP's workpapers.

[137] For example, FMC claims that a siding needed to serve soda ash traffic at Thayer, WY was included in its opening evidence. However, we could not find where FMC included this investment in its evidence. Although there is a reference to it in the electronic workpapers (Mainqty-r.wk4) pertaining to "Industrial Leads," there is no track mileage assigned.

B. Track Miles

1. Main Lines and Branch Lines

The ORR system would consist of 26 subdivisions, containing approximately 5,300 miles of main line track. UP argues that additional track capacity would be needed on 12 of those subdivisions, totaling 82 miles.[138] Table B-3 shows the areas and amount of track in dispute.

Table B-3

Disputed ORR Track Mileage

	Single Track		Double Track		Triple Track		Quad Track		Total Miles of Track	
Subdivision	**FMC**	**UP**	**FMC**	**UP**	**FMC**	**UP**	**FMC**	**UP**	**FMC**	**UP**
Geneva	9.31	10.51	124.45	123.25	1.5	1.5		0	262.71	261.51
Council Bluffs	0	0	132.25	134.77	114.92	112.4		0	609.26	606.74
Portland	152.63	155.63	30.27	27.27					213.17	210.17
Sidney		0	210.25	208.87	14.1	2.88		12.6	462.8	476.78
Laramie	0	0	272.78	249.52	36.32	59.58		0	654.52	677.78
Pocatello	187.56	183.11	26.61	31.06	0	0			240.78	245.23
Nampa	215.25	209.19	28.75	34.85	0.04				272.87	278.89
LaGrande (1)	72.73	71.97	9.09	9.85		0			90.91	91.67
LaGrande (2)	134.74	130.44	70.5	74.8					275.74	280.04
Marysville	98	65.14	188.16	221.04					474.32	507.22
Cumberland Ind	10.07	10.21							10.07	10.21
Orin	42.84	39.48	60.26	63.62					163.36	166.72
Totals	**923.13**	**875.68**	**1,153.37**	**1178.9**	**166.88**	**176.36**	**0**	**12.6**	**3730.5**	**3812.96**

For three of these subdivisions — Geneva, Council Bluffs, and Portland — FMC agrees that more track would be needed, indeed slightly more than UP suggests. We use UP's track configuration for these subdivisions, however, because UP's evidence — which is based on a study prepared by CANAC[139] and substantiated by multiple analytical techniques — is the better evidence of record here.

Turning to the Sidney subdivision, UP insists that the North Platte-O'Fallons segment (12.6 miles) must be quadruple tracked to handle estimated traffic volumes. FMC (without explanation) would only triple track this line segment. CANAC explains that the volume projections for the ORR are in the upper range of general capacity for triple track and a fourth main line would be necessary to handle merging traffic at O'Fallons and traffic entering and exiting the busy North Platte terminal area. FMC, which has accepted some of CANAC's recommendations on this subdivision,[140] is silent

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[138] As noted *supra*, n.131, FMC simply miscalculated the branch-line route mileage for one of the 12 subdivisions at issue–the Cumberland Industrial Lead.

[139] FMC acknowledges CANAC's expertise in rail capacity analysis and planning and accepts a large number of its recommendations. *See, e.g.*, FMC Reb. V.S. Stern at 30.

[140] *See,* FMC Reb. V.S. Stern at 11, Exh GLS-1.10.

on the issue of quadruple track for this short segment. Because the CANAC evidence is unrefuted, we conclude that this segment would need quadruple track.

For the Laramie subdivision, FMC initially provided for triple track for the entire eastern end of this subdivision between mile post (MP) 565.41 (Laramie) and MP 510.78 (West Cheyenne). UP agreed that triple track would be needed over the mountainous grade between Laramie and Speer. However, FMC changed its track configuration on rebuttal, ending the triple track at MP 545.6, just prior to the Hermosa tunnel, and limiting investment to only double track from that point into Laramie, without explaining why it no longer considered triple track necessary for that segment. We cannot accept such a change on rebuttal when the opposing party has acquiesced to the original evidence but is not afforded the opportunity to reply to the new evidence.

For the Marysville subdivision, UP claims that FMC's track configuration is inadequate to handle the number of trains that would move over that subdivision. UP would add 146.1 miles of track to FMC's initial specification, for a total of 197.6 miles of double track and 86.9 miles of single track with six sidings 2.5 miles long. FMC maintains that it included 122 miles of additional double track, with crossovers at intervals of 11 to 13.5 miles as suggested by CANAC. FMC argues that UP's proposal to include double track beyond that recommended by CANAC is unnecessary.

CANAC recommended a minimum of 137.65 miles of additional track to handle the projected traffic. It noted that more track capacity would be required for the ORR to match UP's 1996 performance.[141] Furthermore, UP's and CANAC's estimates for required track are based on volume projections lower than the ones we have accepted here. Because CANAC's minimum recommendation is greater than FMC's and because we have found that the ORR would handle more traffic than projected by UP and CANAC (suggesting that CANAC's recommendation may need to be increased somewhat), we conclude that UP's is the better evidence of record.

For the remaining five subdivisions,[142] UP and FMC have essentially the same configuration, with UP including slightly more double track (approximately 19 more miles). FMC adopts CANAC's recommendations for these segments because "CANAC is a respected third party vendor, and although paid by the Union Pacific in this instance, appears to be making a balanced, fair argument."[143] As with the Marysville subdivision, UP's and CANAC's analyses are based on lower traffic volumes. Furthermore, while CANAC specifies somewhat less rail investment than UP, it notes that more investment would be required for the ORR to match UP's 1996 performance. Because our restated traffic levels are above UP's and CANAC's, we accept UP's minimally greater track investment. Our findings regarding the ORR's track miles are set out in the table below.

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[141] CANAC Report at 7.

[142] Pocatello, Nampa, La Grande (1), La Grande (2) and Orin .

[143] *See,* Reb. V.S. Stern at 51.

Table B-4

ORR Track Mileage

Subdivision/Branch*	Single	Double	Triple	Quad	Total Miles
Chicago	2.4				2.40
Rockwell	4.2				4.20
Geneva	10.51	123.25	1.5	0	261.51
Boone (1)		74.2	1.5		152.90
Cedar Rapids Ind		8.6			17.20
Boone (2)		277.31	3		563.62
Council Bluffs	0	134.77	112.4	0	606.74
Sidney	0	208.87	2.88	12.6	476.78
Laramie	0	249.52	59.58	0	677.78
Salt Lake		29.93			59.86
Pocatello	183.11	31.06	0	0	245.23
Nampa	209.19	34.85			278.89
LaGrande (1)	71.97	9.85			91.67
LaGrande (2)	130.44	74.8			280.04
Portland	155.63	27.27			210.17
Seattle	3.51				3.51
St. Johns Spur	7.82				7.82
River Ind	4.05				4.05
Marysville	65.14	221.04			507.22
North Platte		271.64			543.28
Orin	39.48	63.62			166.72
Cumberland Ind	10.21				10.21
Elkol Ind.	2.58				2.58
Dry Valley	25.8				25.80
Portland Branch	0.52				0.52
South Rivergate	0.5				0.50
Add'l Branch Lines	76.79				76.79
Add'l Industrial Leads	71.6				71.60
Total Route Miles	1,075.45	1840.58	180.86	12.60	
Total Track Miles	1,075.45	3,681.16	542.58	50.4	5,349.59

* Subdivisions in **bold** are those in dispute

2. Maintenance Track

While UP would have two 1,000-foot maintenance-of-way (MOW) tracks at each of the yards, FMC does not separately provide for MOW track. Under FMC's proposal, maintenance work would be performed by contractors. However, even if contractors performed maintenance, FMC does not indicate where the MOW equipment would be located and whether the yards it proposes could accommodate such equipment without interfering with other operations. Furthermore, FMC does not comment on UP's inclusion of MOW track in its yard configurations. In the absence of any explanation by FMC as to the feasibility of not having MOW track and because, as discussed below, we accept UP's design for yards, we accept UP's inclusion of 12.88 miles of MOW track.

FMC does not include any track for bad-order set-outs, but would set out defective equipment in yards, passing sidings and shipper spurs. UP argues that FMC's plan to would not be operationally feasible because yard tracks would often be too far from the location where the defect was detected, and using passing sidings or shipper spurs would interfere with the use of those tracks. Instead, UP would have the ORR place set-out track in close proximity to each defective equipment detector. It contends that this is necessary if defect detectors are to serve their purpose — removing defective equipment from service before a serious operational problem occurs.

While FMC would provide defective equipment detectors to identify bad-order cars, the track charts submitted in evidence indicate that for many detectors no yard or industrial spur track would be available on which defective cars could be conveniently parked until repairs could be made. Without set-out track or other track that would not be used frequently for other ORR operations, defective cars could interfere with the efficient operation of the ORR.[144] We therefore find that the ORR could not operate effectively without set-out track and we include 17.12 miles of such track in our SAC analysis.

3. Yards

There would be 36 yards of various sizes in the ORR system. The primary yards for the ORR would be at Chicago, IL (Proviso Yard); Kansas City, KS (18th St. Yard); North Platte, NE; Green River, WY; Pocatello, ID; and Portland, OR (the Albina and Barnes yards). The ORR would also have yards at Bill, WY and South Morrill, NE, to support its service in the Powder River Basin. Other yards throughout the system would provide facilities for changing crews, interchanging traffic with other carriers, or switching traffic to industries. The size and configuration of the yards are largely dependent on their function and the number of cars they process. There would be three intermodal ramps in Chicago (Global 1, Global 2 and Canal Street), an automotive ramp in West Chicago, and automotive and intermodal yards in Kansas City and Portland.

UP and FMC generally agree on the location of the yards and on the size of the following yards: Fremont and Northport, NE; McCammon and Nampa, ID; Hinkle, OR; Marysville, Topeka, and Lawrence, KS; Glencoe Jct. WY; and West Chicago, IL. They disagree on the size of the other yards, but the information provided about these yards is minimal. Neither party specifically linked

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[144] While not disputing that the use of set-out track is a common railroad practice, FMC points to UP's Marysville Subdivision track charts that show a detector at MP 270 but no set-out track. However, this reference to a single location on the UP where no set-out track is near a detector does not provide sufficient evidence to assume that, contrary to current rail industry practice, an entire rail system could operate without set-out track.

the ORR's traffic levels with specific yard operations and the configuration of each yard. While the parties provided some description of yard functions, there are generally no references to the number of cars that would be switched, the number of trains that would pass through the yards, the timing of train arrival/departure, crew changes or interchange requirements.

FMC has failed to present documented evidence that its yard designs would be capable of fulfilling their necessary functions. It merely relied on the unsupported yard design of its witness and baldly claims that such yards would be adequate for the ORR. For example, FMC does not discuss the amount of traffic each yard would handle or compare the yards it proposes to the size of UP yards that handle traffic that the ORR would carry. Such evidentiary shortcomings make it impossible to judge whether the yards proposed by FMC meet the SAC feasibility requirement. Consequently, we find that the ORR would need the investment to build yards as UP has designed them.[145] This does not mean that we view UP's evidence as designing the most efficient, least cost operations, but only that FMC has failed to meet the initial burden of demonstrating that its yard design is feasible.

APPENDIX C — ORR ROAD PROPERTY INVESTMENT

This appendix examines the evidence and arguments of the parties concerning construction of the ORR. Table C-1 summarizes the cost estimates associated with completing various aspects of that construction process. We find that it would cost almost $8.4 billion to build the ORR.[146]

Table C-1

ORR Investment Costs ($ millions)			
Category[147]	**UP**[148]	**FMC**[149]	**STB**
A. Land	$562.4	$239.5	$352.3
B. Grading	2,350.1	1,069.0	1,261.5
C. Bridges	1,263.0	768.0	807.3
D. Culverts	93.4	63.5	74.4
E. Tunnels	26.2	22.0	26.2

[145] We note that UP's yards at West Cheyenne/Speer and Green River are smaller than those designed by FMC.

[146] The parties' dollar values attributed to each investment category may not agree with those shown in later tables. This is due to a different grouping of expenses for Table C-1.

[147] The value for track construction is the sum of track, lubricators and road crossings. The value for public improvements is the sum of grade separations, fencing, roadway signs and other public improvements. The value for signals and communications is the sum of communications, signal systems and detectors. The value for buildings and facilities is the sum of buildings and facilities and TOFC/COFC/auto.

[148] UP Reply V.S. McDonald/Webb, Table GM/HW-1.

[149] FMC Reb. V.S. Pattison, Table RKP-1. Certain individual investment values from V.S. Pattison do not agree with the values in FMC's DCF spreadsheet prepared by witness Burris.

ORR Investment Costs ($ millions)			
F. Track Construction	3,990.4	3,021.3	3,249.5
G. Public Improvements	347.1	192.5	184.8
H. Signals & Communication	562.7	451.1	489.5
I. Buildings and Facilities	574.1	207.8	318.6
J. Mobilization	304.5	84.8	151.5
K. Engineering	1,126.6	508.6	746.9
L. Contingency	1,322.9	448.0	730.9
Totals	**$12,523.4**	**$7,076.1**	**$8,392.6**

A. Land

1. Right-of-Way Width

The width of the right-of-way (ROW) directly affects the amount of land that would be needed. ROW width is dependent on a number of factors including the width of the roadbed, the geometry (slope) of the cuts and fills, the size of drainage ditches, etc. FMC used a ROW width of 100 feet for most of the ORR's route. UP specified an average 120-foot wide ROW[150] to accommodate a wider roadbed, wider drainage ditches, a maintenance road, and more gradual slopes of cuts and fills.[151]

a. Roadbed Width

An adequate roadbed width is critical to providing a stable surface upon which to build the track structure. The parties agree on the width of the roadbed for segments of the ORR east, but not west, of Granger, WY.[152] FMC argues that, because the ORR would carry less traffic on the system west of Granger, only a 24-foot wide roadbed would be needed. UP asserts that a 28-foot roadbed would be necessary because the ORR would operate high-speed intermodal and heavy-loading grain, soda ash and other bulk commodity trains over the western segment.

[150] UP's ROW width varied depending on the topography of individual sections of the ORR.

[151] Both parties provided for a wider ROW at yards and terminal locations, where multiple tracks are needed, and where necessary to accommodate earthwork (cuts and fills). FMC limited the ROW to 75 feet in industrial and commercial areas in and around Chicago and Portland.

[152] The parties agree on the need for a 28-foot wide roadbed east of Granger for single track and an additional 15 feet for each additional track (*e.g.*, double track would require a width of 43 feet). The ORR's roadbed east of Granger would be wider than required in previous SAC cases because of the extremely high traffic densities, which the parties agree would require a wider roadbed to support the loading.

We accept FMC's 24-foot roadbed width for the ORR system west of Granger. UP has not shown that a 24-foot wide roadbed would be inadequate; rather it merely states that a 28-foot wide roadbed would be better able to absorb vibrations.[153] However, under the SAC test the complainant is free to design the stand-alone railroad in any feasible manner. Because a 24-foot wide roadbed has been found to be feasible in other applications,[154] and has not been shown to be infeasible for the ORR system west of Granger, it is accepted here.

b. Maintenance Roads

Maintenance roads would parallel the ORR tracks and provide a means for inspecting and maintaining the track. UP contends that a 6-foot wide road would be required along most of the ORR. Without such a road, UP claims that up to 50% more maintenance personnel would be needed. FMC asserts that maintenance could be accomplished without a road paralleling the entire system.

UP provides no evidence or data supporting its contention that the lack of a maintenance road would significantly increase the number of maintenance personnel needed. In prior cases, a maintenance road has not been incorporated into the SAC analysis and, in fact, many rail lines in operation today do not have roads paralleling the entire line. Consequently, we do not find that a maintenance road along the entire ORR would be necessary.

c. Side Slopes

Uneven terrain over any railroad ROW requires that higher ground be cut away and lower ground filled in. Where cuts and fills are made, the slope of the ground from the top to the bottom of the fill or from the bottom to the top of the cut governs the width of the excavation. UP asserts that standard railroad practice is to limit the side slopes of cut or filled areas to a ratio of 2:1 or less. It submitted an analysis that purportedly supports the need for an even more gradual slope on the ORR.[155] FMC notes that general railroad engineering standards allow steeper 1.5:1 side slopes in many situations.[156] It argues that UP's generalized analysis has not shown that soil conditions along the entire length of the ORR would require more gradual side slopes.

We agree with FMC. UP has not provided route-specific information to demonstrate that a 1.5:1 slope is infeasible. Its soil analysis is too generalized, offering only State-wide conclusions on soil stability to show that a minimum 2:1 side slope would be required on the entire ORR. Moreover, a 1.5:1 slope is commonly used in railroad design. Although it might be UP's practice to use more gradual slopes than FMC's proposed 1.5:1, the American Railway Engineering and Maintenance-of-Way Association (AREMA) manual also recognizes that a 1.5:1 slope is commonly used.

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[153] We note that UP elsewhere in its evidence acknowledged that the main line west of Granger would not be subject to the same stresses as the track east of Granger. *See,* discussion of "Track Construction," *infra*, where UP suggests that lighter weight rail could be used west of Granger.

[154] *See, e.g., West Texas*, 1 S.T.B. at 704.

[155] UP's geotechnical analysis (UP Reply Workpapers McDonald/Webb, GM/HW 035-126) consists of conclusions based on geologic maps and reports, topographic maps, seismicity maps prepared by the United States Geological Survey, and aerial photos with soil interpretations by the Soil Conservation Service.

[156] *Railroad Engineering*, William W. Hay, 2nd edition 1982, at 296.

d. Drainage Ditches

Drainage ditches parallel the tracks and channel water, snow, eroded soil and debris away from the track structure. FMC proposes to use ditches that are 2 feet wide and 2 feet deep. UP claims that such ditches are not cost effective because they would require more frequent maintenance to keep them clean. UP advocates use of ditches 8 feet wide and 3 feet deep.

We accept FMC's proposed smaller ditches. There are no industry standards of which we are aware, and UP has not shown that FMC's proposed ditches would be infeasible, but only that vigilance would be required to keep the ditches clear of debris.

e. Diversion Ditches

Diversion ditches are sometimes located at the top of cut slopes where the undisturbed ground slopes toward the track section. According to UP, diversion ditches must be provided at the top of cuts to direct water away from the devegetated slopes left after excavation. If not installed, water draining down the slopes would erode the soil, silting in drainage ditches and potentially spilling onto the track area. FMC claims that such diversion ditches are not a necessity and states that another carrier, CSXT, does not always use such ditches. We agree with FMC. UP has failed to show that slope erosion would require these ditches. To the contrary, FMC has produced evidence that at least one other major railroad does not consider such ditches indispensable.

f. Conclusion

Based on our review of all of the issues affecting ROW width, we accept FMC's basic parameters for roadbed geometry and ditches. However, FMC's design width does not reflect the impact of terrain changes upon the ROW. UP's estimate of ROW width is calculated on a section-by-section basis and reflects the impact of local terrain. We have used UP's method, adjusted for FMC's parameters, to estimate the average ROW width (106 feet) and to restate the amount of land needed for the ORR.[157]

2. Land Values

The parties use similar appraisal methods to estimate land costs, but UP included certain additives which FMC considers barriers-to-entry. The following table shows the parties' proposed investment in land and our restatement.

[157] UP does not comment on FMC's use of a 75-foot ROW in urban areas. In the absence of evidence that a 75-foot ROW in urban areas would be infeasible, we accept FMC's use of a 75-foot ROW in Chicago and Portland.

Table C-2

Real Estate Costs ($ millions)			
	UP	**FMC**	**STB**
1. ROW Land Value	$280.3[158]	$177.8[159]	$228.3
2. Assemblage Costs	163.1	5.1	5.0
3. Yards	117.5	54.9[160]	117.5
4. Microwave Site	1.5	1.8	1.5
Totals	**$562.4**	**$239.5**	**$352.3**

a. Right-of-Way Value

FMC estimated land values using research reports from agricultural economists in several States. The reports are based on geographical trends, studies and some sales transactions. UP used a comparable sales approach to estimate the value of land by analyzing prices of parcels of land near or adjacent to the ROW. Because UP provided a more detailed and comprehensive estimate of land values, including a physical inspection of properties to ensure suitability for rail use,[161] UP's comparable sales approach is the best evidence of record.

Based on an average ROW width of 106 feet, we have restated the total acreage required for the ROW and developed the cost of acquiring such land based on UP's land appraisal. The restated ROW investment in land is $246.0 million.[162]

b. Assemblage Factor

An assemblage factor is a premium paid above comparable land prices to reflect the additional cost of assembling a contiguous parcel of land required for the ORR's ROW. UP assumed that the ORR would incur substantial additional costs to assemble a contiguous ROW. In prior cases, we

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[158] Includes the cost for easements.

[159] Derived from FMC spreadsheet LANDREQ.XLS

[160] Yards were derived from FMC spreadsheet LANDREQ.XLS and industry tracks/yards from FMC workpapers.

[161] UP contends that the cost of acquiring land for the ROW by easement would be the same as purchasing the land outright. However, it presented no evidence that easements along the ORR ROW were purchased by UP or its predecessor railroads. FMC argues that railroads historically did not pay for easements and that requiring the ORR to pay for similar easements would constitute a barrier-to-entry. We agree with FMC. Historically, railroads did not pay for easements and, as in prior cases, we will not require the stand-alone railroad to purchase easements unless the railroad demonstrates that such costs were incurred when the line was originally constructed. *McCarty* at 504.

[162] We have used UP's spreadsheets to calculate the ROW investment by developing a ratio of UP's proposed ROW width to our restated ROW width.

have found that, absent evidence that an assemblage premium was incurred when the existing railroad was constructed, the inclusion of an assemblage premium in the price the stand-alone railroad would pay for land creates a barrier-to-entry.[163] Here, much of the ROW that the ORR would traverse has long been in existence and was dedicated to rail service at a time when the Government gave the land to the western railroads. FMC does agree, however, that an assemblage premium is appropriate for the relatively newly constructed Orin Line and included $5 million to cover this additional cost.

UP argues that it paid an assemblage cost for the current ROW when it purchased numerous predecessor railroads. It includes an additional $163.1 million in assemblage costs. FMC, however, notes that when UP acquired the CNW-WRPI (700 miles of the ORR), the fair market valuation of the land was 30% less than the value on the books of the CNW. This, FMC asserts, represents a negative assemblage factor.

We agree with FMC that general application of an assemblage factor would create a barrier to entry, because it is a cost which has not been borne by UP. UP's argument that it incurred assemblage costs when the railroad was acquired in the late 1800s is unavailing because there is no quantification of the assemblage premium assertedly incurred. Furthermore, UP's examples of properties on which an assemblage premium has been paid are not properties that would be included in the ORR ROW. Because UP has not shown that it actually paid assemblage factors on its predecessor lines or has paid those costs on its expansion projects along the ORR's ROW, we preclude them as barriers to entry. Where the parties agree that assemblage factors have actually been paid, we include those costs.

c. Yards

As addressed in Appendix B, we have rejected FMC's evidence on yards because FMC has not demonstrated that the proposed yards could handle the forecast traffic levels. Because we use UP's evidence on yard configuration, we use UP's estimate on the amount of land needed for such yards.

d. Microwave Towers

FMC and UP agree that land for microwave towers would be required. FMC included a slightly higher cost ($1.8 million) than UP ($1.5 million) to purchase such land. Because we use UP's land valuation, we use UP's (lower) cost estimate for land for microwave towers.

B. Grading

The table below shows the parties' proposed investment in each category of grading investment, as well as our findings as to the most reasonable estimate.

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[163] *See, West Texas*, 1 S.T.B. at 670-71; *Burlington N.R.R. v. STB*, 114 F.3d at 214.

Table C-3

Grading Costs ($ millions)			
	UP	**FMC**	**STB**
1. Clearing & Grubbing	$29.8	$21.4	$21.1
2. Earthwork Costs	2,080.7	998.2	1,115.7
3. Drainage at Major Yards	40.1	0.0	40.1
4. Water for Compaction	21.7	0.7	21.7
5. Topsoil	27.9	0.0	0.0
6. Geotextiles	20.1	9.0	9.0
7. Seeding	28.2	0.0	0.0
8. Road Resurf. & Util. Relocation	49.4	1.7	1.7
9. Environmental Mitigation	1.5	0.0	1.5
10. Riprap, Wing Walls and Aprons[164]	50.7	48.7	50.7
Total	**$2,350.1**	**$1,079.7**	**`$1,261.5**

1. Clearing and Grubbing

Before grading can begin, the ROW must be cleared of trees and other vegetation. The parties agree on the unit cost (the cost of clearing an acre of land) for such work. The difference between their total estimates for this work reflects the difference in the amount of land each assumed must be cleared to construct the ORR. We have determined the amount of ROW that would need to be cleared by multiplying the total route miles of the ORR (*See,* Appendix B) by the ROW width (*See,* discussion above in this appendix).[165]

In addition to clearing the land, UP claims that a construction road, installed during clearing and grubbing operations, would be required along the entire ORR ROW, at a cost of $1,000 per mile. FMC claims that a construction road would only be required around each bridge site, but has failed to explain why a construction road would only be needed at those locations. Because it is reasonable to assume that some limited measures (*e.g.*, a gravel base) would be needed at some non-bridge locations to ensure that equipment could efficiently access the construction site, and because the $1000 per-mile figure suggested by UP is modest, we find that UP's evidence is the better evidence.

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[164] The parties include the costs for riprap, wing walls and aprons for culverts in their grading spreadsheets. For convenience we also include these costs in grading, but discuss these issues in the section on culverts, *infra*.

[165] Because we use UP's yard design (*See*, Appendix B), we use UP's grading quantities for yards.

2. Earthworks

The amount of soil that must be moved to construct a suitable roadbed for the ORR is dependent upon a variety of factors, including the local topography, the width of the roadbed, the need for maintenance roads, the required slope of excavated terrain, and the size of drainage ditches. We have used UP's grading model because it is based on UP's superior ROW width analysis and because FMC does not challenge any of UP's equations or underlying assumptions in its grading model. By adjusting UP's grading model to incorporate our findings on roadbed width, side slopes, drainage ditches and maintenance roads, we have developed the amount of earthwork that would be required to construct the ORR's ROW.

Once the determination is made as to the total amount of earth that must be moved, an estimate of the cost of such work is developed by multiplying the cost of moving a specific quantity of soil (unit cost) times the number of units of soil that must be moved. FMC's unit cost was developed from the R.S. Means Manual (*Means*) based on the use of specific types of equipment. UP developed its unit cost for earthwork on the use of different, more productive equipment.

UP has not shown that it would be infeasible to use the equipment selected by FMC. Indeed, FMC's cost estimates are based on a recognized source used by construction companies to estimate project costs. While the equipment UP would have the ORR use could also accomplish the required work, and may be more productive, it has a higher unit cost for moving soil than the equipment FMC would have the ORR use. FMC is entitled to have the equipment that results in the overall lowest cost used. Therefore, we use FMC's unit costs for grading to determine the total earthwork costs.

3. Drainage at Major Yards

UP included $40.1 million for drainage (inlets, storm collectors, manholes and drains) for its major yards. FMC did not include any costs or explain why such costs could be avoided. Consequently, we accept UP's uncontested cost for this investment.

4. Water for Compaction

UP maintains that water must be used to ensure proper compaction of the soil in arid and semi-arid areas. This would ensure that the roadbed would not compress or become unstable when first exposed to heavy train loadings. While not disputing the need for water, FMC claims that the cost associated with the use of water constitutes a barrier to entry (which we exclude from our SAC analysis) because water was not used when the existing line was originally constructed.[166]

Engineering and construction methods have changed since the original railroads were constructed. Indeed, most of the construction techniques that FMC would use to build the ORR were not used to build the original lines. Costs associated with modern construction practices, as opposed to costs associated with obstacles not encountered when the original rail lines were constructed, do not constitute barriers to entry. Just as the original railroad had to ensure that the roadbed was adequately compacted for the traffic that it would handle, so too must the ORR. Because modern construction methods recognize the importance of adding water to low moisture content soil to ensure the proper compaction necessary for high density rail operations, we conclude

[166] FMC included $710,000 in water costs for that portion of the ORR that would replace the recently constructed Orin line, where water was used for compaction.

that the ORR construction process would need to use water to ensure an adequately compacted roadbed in arid and semi-arid areas.[167]

5. Topsoil Replacement

UP included the cost of removing, stockpiling and replacing topsoil from graded areas of the ORR. UP claims that topsoil replacement is required in Wyoming and that replacing the original topsoil after construction in other States would facilitate vegetative growth, protecting the ROW from erosion. FMC claims that this cost is a barrier to entry, as we found in *West Texas*, 1 S.T.B. at 706.

UP has not shown that it or its predecessors incurred such a cost along the route the ORR would traverse. As noted by FMC, we have found in previous proceedings that this cost represents a barrier to entry.[168] Without a showing by UP that it has incurred this expense or its equivalent, we continue to exclude the cost associated with topsoil replacement as a barrier to entry.

6. Geotextile Fabric

Geotextile fabric keeps the ballast and subballast clean by acting as a barrier that prevents fine soil from migrating upwards from the graded ROW and fouling the ballast and subballast. Based on its geotechnical analysis, UP claims that fabric would be required under all grade crossings, turnouts, and 1,190 route miles of main line track with poor soil conditions. FMC agrees that fabric would be needed under grade crossings and turnouts, but claims that UP has overstated the need for geotextiles elsewhere. FMC maintains that only 200 miles of main line has soil conditions that would require the use of fabric.

We include the cost of installing fabric under all grade crossings and turnouts, but only under 200 miles of main line track. As noted earlier, UP's geotechnical analysis is too generalized to show that soil conditions over large expanses of the ORR would require installation of fabric. As we have found in other cases, geotextile fabric is not needed for all roadbed[169] and UP provides no evidence that fabric has been installed under the entire line that the ORR would replace.

In addition to disagreeing on the amount of fabric that would be needed, the parties also disagree on the cost of the fabric. FMC used a fabric cost of $1.75 per square yard from *Means*. UP did not provide support for its higher fabric cost. Thus, we use FMC's supported fabric cost.

7. Seeding

UP would have the ORR seed all excavated areas and embankment slopes. It claims that a review of engineering reports indicates that sodding, planting of willow trees and other erosion control measures were used in the 1860s, when this line was first constructed. UP notes that seeding reduces the cost of clearing debris from drainage ditches and prevents the erosion of materials from ROW slopes. FMC excluded seeding costs as a barrier to entry, stating that UP provided no support for its claim that the entire ROW was revegetated when these lines were built.

In *McCarty* and *West Texas*, the parties agreed on the need for seeding. In *Arizona*, we found that seeding was a barrier to entry because the vegetation along the ROW was natural growth. Here,

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[167] *See, Arizona I,* at 406.

[168] *See, e.g. West Texas*, 1 S.T.B. at 706.

[169] *See, Arizona I*, 406.

UP has provided no verifiable evidence (the engineering reports it relied upon were not supplied) that significant portions of the ROW were replanted after grading was completed. Because we generally regard seeding costs as a barrier to entry, we will not include such costs.

8. Road Surfacing and Utility Relocation

UP included costs for resurfacing roads damaged during construction and for relocating utilities in the construction corridor, claiming that any new construction would incur these costs. It claims that FMC is inconsistent in assuming that the ORR would use existing roads and utilities to construct the line, but also assuming that this infrastructure does not exist because it has not included costs associated with such infrastructure. FMC argues that most of UP's ROW that the ORR would replace was constructed before surfaced roads or utilities in the area existed. It claims, therefore, that resurfacing and relocation costs are barriers to entry because UP or its predecessor railroads did not incur these costs. FMC does agree that such costs should be included for that portion of the ORR that would replace the Orin line, which was constructed in the 1970s.

Because most of the lines that the ORR would replicate were constructed before there were any utilities or paved roads in the area, we agree with FMC that these costs, with the exception of those incurred during construction of the Orin line, are barriers to entry.[170] UP does not argue that it incurred these costs, but rather it contends that, because the ORR would benefit from use of this infrastructure, it should pay all costs associated with repair and relocation of that infrastructure. We disagree. These costs fall into the category of costs we consider barriers to entry, *i.e.*, "costs that a new entrant must incur that were not incurred by the incumbent."[171] In the absence of any proof from UP that such costs were incurred on lines other than the Orin line, we exclude these costs as barriers to entry.

9. Environmental Mitigation

Current environmental regulatory requirements increase the costs of modern railroad construction. UP included such costs for the portion of the ORR that would replace the Orin line. FMC claims that UP did not incur environmental regulatory costs itself and thus these costs represent a barrier to entry. However, the Orin line was constructed in the 1970s, when environmental mitigation costs were imposed on rail construction. Thus, the costs associated with the Orin line should be included.

C. Bridges

Bridge construction includes construction of superstructures (the bridge spans carrying the track) and substructures (the foundations, abutments and piers). The parties agree on the number, length, and location of bridges, and superstructure unit cost for specific size spans. They disagree on the design of bridges less than 150 feet and the transportation cost for some of the superstructure components.

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[170] While FMC agrees that these costs should be included for the Orin line, it did not estimate what these costs would be. We have developed the cost ($1.67 million) for the Orin line by multiplying UP's unit cost per mile by the estimated length of the Orin line.

[171] *See, Burlington N.R.R. v. STB*, 114 F.3d at 214.

1. Bridge Design

To limit bridge construction costs, FMC would have the ORR use a single-span type bridge for all bridges under 150 feet and, where multiple tracks would be needed, FMC would have the ORR install bridges capable of carrying multiple tracks. UP maintains that the use of spans of up to 150 feet may not be cost effective because, while reducing the number of piers, it increases the cost per linear foot for the span. UP also maintains that the use of designs different from those currently used would require additional studies to ensure that the different configuration of piers and superstructure spans would provide an adequate hydrologic flow area or road clearance beneath each bridge. UP does not directly address the use of multiple-track bridges; rather, it developed bridge costs based on the installation of a separate bridge for each set of tracks.

SAC permits the complaining party to specify the least cost alternative to the incumbent railroad. Here, UP has failed to show that FMC's proposal to limit bridge costs by using longer spans and multiple track bridges would not be feasible. Indeed, we note that UP currently uses some multiple-track bridges. Furthermore, UP's mere assertion that in some instances adjustments would be required to accommodate flow or clearances does not rebut the feasibility of FMC's bridge design.[172] Accordingly, we use FMC's evidence on this issue.

2. Bridge Width

UP states that bridge decks must be 16-feet wide to provide walkways for railroad personnel. FMC argues that UP's proposed bridge width varies from UP's current bridge design and notes that UP successfully operates over 14-foot wide bridges with no safety problems. UP has provided no support for its wider bridge spans and UP's current use of 14-foot wide bridges establishes the feasibility of such bridges. Therefore, we use FMC's 14-foot width for bridges.[173]

3. Substructure

FMC developed pier and abutment costs for both single- and double-track bridges. FMC calculated an average pier and abutment cost based on the cost of building piers and abutments of varying heights and load capacity. UP claims that FMC erred in developing substructure costs by using an average rail-to-ground height for all bridges. UP developed individualized substructure costs for each bridge.

FMC contends that UP's substructure costs are overstated because UP's design contained a separate substructure for each set of tracks where multiple-track bridges are required. FMC asserts that a less expensive alternative is to design a single substructure for multiple-track bridges.

UP's bridge costs were developed based on the premise that single-track bridges requiring separate substructures would need to be installed. But UP has not shown that a separate bridge for each set of tracks would be required for engineering reasons. We agree with FMC that UP's approach would be inefficient. Indeed, as noted above, the UP system contains multiple-track bridges. Furthermore, UP has not shown that FMC's use of an average cost for abutments and piers is unreasonable. While use of an average may understate the costs of some piers and abutments, it

[172] We note that minor modifications to some bridges could be funded from monies set aside for contingencies, discussed *infra*.

[173] We note that, despite the disagreement on bridge width, the parties used the same unit costs per linear foot for all single-track bridge spans proposed for the ORR.

will also overstate the costs of other substructure components. Therefore, we see no reason to reject FMC's evidence on this basis.

4. Contractor Markup

UP added a 28% markup to account for the bridge contractor's profit and overhead, based on *Means* bridge construction estimates. FMC reduced the markup to 12%, claiming this would be an adequate figure. We accept UP's profit and overhead figure, as FMC provided no evidence to validate its lower estimate.

5. Transportation

UP claims that FMC's estimated transportation costs for heavy and awkward concrete slabs and steel superstructure bridge components is understated, because it is based on *Means* data that only include transportation costs for projects near large cities. FMC has rebutted UP's argument with evidence indicating that there are a number of facilities along the ORR's route where bridge components could be acquired.[174] We use FMC's evidence. FMC has shown that span components would be available at locations along the ORR's route and, therefore, use of *Means* cost data is appropriate.

In summary, we accept FMC's bridge construction costs but apply UP's 28% markup for overhead and profit. Our restated cost for bridge construction is $807,257,455.

D. Culverts

Culverts permit water to pass under the track structure by means of metal or concrete pipes. The parties agree on the number of culverts that the ORR would need, but disagree as to how the culverts should be constructed, their length and the need for wing walls, aprons and riprap.[175] Based on a discussion with a contractor, UP argues that the most efficient way to install culverts would be to grade the entire roadbed and then excavate the trenches needed for the culverts. FMC proposed installing culverts before grading the roadbed. FMC argues that UP's approach is illogical and inefficient, as such a procedure would make it difficult for personnel, equipment and materials on one side of the raised roadbed to move to the other side of the embankment before the culverts were excavated. Furthermore, such a procedure would require additional trenching and recompacting when the culverts were cut through the continuous roadbed.

We accept FMC's culvert construction procedure, as UP does not argue that FMC's procedure is infeasible. (We also agree that UP's undocumented discussion with a contractor is not adequate support for its proposed procedure, a procedure that on its face appears problematic, as FMC has noted.)

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[174] FMC notes that price quotes for bridge components include as much as a 250-mile allowance for transportation to the construction site.

[175] Wing walls attach to the sides of the culvert, channeling water into and away from the mouth of the culvert. Aprons extend from the floor of the culvert and, along with riprap (large stones placed at the end of the culvert aprons to slow and deflect drainage), prevent erosion at the ends of the culvert.

FMC notes that UP's figures for ORR culverts would, on average, be 16 feet longer than those proposed by FMC, which were generally based on the length of existing UP culverts.[176] Because FMC's culvert lengths are based on the length of existing culverts, they are feasible and we use this evidence.

UP included funds for installing wing walls, aprons and riprap at the ends of the culverts. FMC claims that UP has not shown that existing culverts have these features. FMC submitted photos from four locations showing culverts without riprap.

While it may be that riprap, wing walls and aprons would not be needed at all locations,[177] FMC's limited sample does not establish that such investments could be avoided at all ORR locations, and FMC does not identify which culverts would not need these items. Therefore, we include these costs in our restatement.

The parties disagree on the procedure used to estimate the costs for the various size culverts that would be needed. UP developed the cost of constructing several sizes of culverts and used this data to interpolate the cost associated with culverts of other sizes. FMC reviewed UP's data and developed different equations to better interpolate the data. Our review of the data indicates that FMC's interpretation of the data produces the better statistical fit and we use FMC's evidence.

E. Tunnels

The parties agree on all tunnel issues with the exception of mobilization and demobilization costs and the appropriate size of the Hermosa tunnel. UP included funds for mobilization and demobilization of the equipment and the manpower used in tunnel construction. FMC claims that UP double counted these costs by including such costs both in tunnel investment and in a separate calculation of mobilization cost. FMC is correct; UP included mobilization costs specifically for tunnels twice. *See,* discussion of mobilization costs, *infra*. Thus, we exclude mobilization costs here.

UP would have the Hermosa tunnel accommodate triple track, while FMC, in its rebuttal evidence, downsized the tunnel from triple track to double track. As discussed in Appendix B, FMC's rebuttal evidence is procedurally improper. We use the triple-track evidence originally presented by FMC.[178]

F. Track Construction

The parties agree on tie costs and quantities, turnout specifications and costs, the need for insulated joints, and the costs and quantities for pandrol screws and plates. They also agree that the ORR would use 133-pound continuous welded rail (CWR) for main line and passing track east of Granger and 115-pound CWR for main line and passing tracks west of Granger.

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[176] FMC adjusted UP's existing culvert length where the ORR would have a different number of tracks than UP currently has traversing the culvert.

[177] The culverts in FMC's photographs appear to be relatively minor culverts.

[178] FMC Open. Pattison Exh. RKP-1.12 Laramie Subdivision.

1. Rail

UP and FMC disagree on the need for extensive use of premium quality rail.[179] UP would have the ORR install premium rail on all track handling in excess of 50 million gross tons (MGT) of traffic annually. FMC proposes for the ORR to use premium rail for all 133-pound rail and on curves greater than 2 degrees where 115-pound rail is installed. (FMC would install standard rail on 115-pound tangent track.)

The parties agree that rail type and maintenance cost are related. Therefore, because, as discussed in Appendix D, we use UP's maintenance-of-way cost estimate, we accept its use of premium rail for all track handling more than 50 MGT of traffic annually.

The parties also disagree on the cost of rail. In its opening evidence, FMC claimed that premium rail could be purchased for $663 per ton. Based on a documented phone conversation with Rocky Mountain Steel, UP stated that standard rail costs $654 per ton, with premium rail priced about 13.5% higher. To support its original estimate, on rebuttal FMC submitted a written 1999 quote from Rocky Mountain Steel for premium rail at $620 per ton plus $30 per ton for shipping. While not doubting the veracity of the UP price quote, a stand-alone railroad is entitled to avail itself of the lowest cost available. Therefore, we use FMC's evidence from its opening statement, as that evidence has been corroborated by a written price quote.

2. Switches

UP claims that FMC failed to provide for powered switches and turnouts for the run-through and departure tracks at the ORR's major classification yards (Chicago, Kansas City and North Platte). FMC proposes that the ORR yards could operate with a mixture of hand-thrown and powered switches. FMC points out that CSXT's terminal in Baltimore, MD, and Norfolk Southern's complexes in Charlotte, NC and Hagerstown, MD are operated in this manner.

Given that major railroads operate large yards with both hand-thrown and powered switches, we find that such operations would be feasible for the ORR. However, because FMC's evidence on the configuration of yards was rejected, we use UP's evidence providing for a greater number of switches. Because FMC did not provide any evidence as to what percentage of switches could be manually operated, we are unable to adjust UP's evidence to provide for a mixture of hand-thrown and powered switches.

3. Rail Lubricators

UP claims that lubricators should be added to curves of three degrees or greater and on curves carrying more than 50 MGT. UP included the same number of lubricators that it currently has on its system. FMC would place lubricators at the beginning and end of curves of 3 degrees or greater and would install more lubricators than UP currently uses. We use UP's estimate, which is based on UP's actual operations, because it results in a lower cost.

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[179] Premium rail is fabricated from a harder steel than standard rail. Although it costs more to produce, it has a longer life.

G. Public Improvements

Table C-4

Crossings, Signs and Fences ($ millions)			
	UP	**FMC**	**STB**
1. Highway Crossings & Warning Devices	$171.7	$9.4	$9.4
2. Railroad Crossings	0.8	0.8	0.8
3. ROW Fences	157.3	66.6	157.3
4. Snow Fences	16.9	5.6	16.9
5. Signs	0.4	0.4	0.4
Total	**$347.1**	**$82.8**	**$184.8**

1. Highway Crossings and Warning Devices

UP included the cost of highway crossings and warning devices for all road crossings along the ORR ROW. FMC claims that these costs should be excluded as barriers to entry except on segments where UP paid for such investment.

In *West Texas*, 1 S.T.B. at 672, we determined that the costs associated with grade crossings would constitute a barrier to entry if the defendant railroad had not incurred those costs itself. Thus, FMC included only the amount ($7.9 million to construct grade crossings and overpasses and $1.5 million for highway warning devices) that would be needed on the Orin line. Because there is no evidence that the railroad incurred crossing costs on other segments, we use FMC's evidence.

2. Railroad Crossings

The parties agree on the cost of constructing railroad crossings.

3. Right-of-Way Fences

UP states that urban/suburban and cultivated land would comprise approximately 66% of the ORR's ROW and would require fencing. An additional 24% of the ORR ROW would pass through rangeland and UP suggests that fencing could be justified to prevent livestock from straying onto the tracks.

FMC would have the ORR fence 25% of the ROW, claiming that only Kansas and Oregon have fencing requirements. According to FMC, in other jurisdictions, while the railroad would be liable for damages, the question of fencing is a business decision requiring the balancing of the risk of damages versus fencing costs.

FMC provided no evidence to support its assertion that only 25% of the ROW requires fencing. UP's workpapers, on the other hand, show that six of the States traversed by the ORR have fencing requirements.[180] Thus, we find that FMC's proposed fencing would not be sufficient to meet the legal requirements faced by the ORR as well as the existing railroad, and we use UP's fencing estimate.

4. Snow Fences

Snow fences protect hundreds of miles of UP's ROW in the high country of Wyoming, western Nebraska, and eastern Idaho from blowing and drifting snow. UP included a total of $16,948,800 (at a unit cost of $10.70 per linear foot) for snow fencing for the ORR. FMC questions UP's cost estimate, which was based upon the recollections of an UP employee. However, rather than offering any evidence of its own, FMC merely arbitrarily reduced UP's cost estimate by two-thirds. In the absence of any support for FMC's reduction or any independent evidence on the cost of snow fencing, we use UP's evidence.

5. Signs

The parties agree on the total cost of signs that would be needed by the ORR.

H. Signal and Communication Systems

Table C-5

Signals and Communication ($ millions)			
	UP	**FMC**	**STB**
1. Centralized Traffic Control	$312.1	$307.7	$312.1
2. Power for Signals	7.1	1.7	2.4
3. Electric Locks	13.8	1.0	1.7
4. Dispatching Center	3.9	3.7	3.7
5. Electrode Regenerative Repeaters	15.3	15.3	15.3
6. Future CTC Needs	29.2	0.0	0.0
7. Defect Detectors	14.7	14.6	14.7
8. Slide Fences	28.9	0.0	28.9
9. Wind Detectors	0.3	0.0	0.3
10. Microwave System	104.4	78.5	78.5
11. AEI System	6.4	0.8	5.4
12. Railroad Crossings	2.0	2.0	2.0
13. Switch Heaters	24.5	26.0	24.5
Totals	**$562.7**	**$451.3**	**$489.5**

1. Centralized Traffic Control

With the exception of costs for the line serving the Powder River Basin coal field, the parties agree on the cost for a centralized traffic control (CTC) system. UP estimated that the cost for the Powder River Basin CTC would be $53.3 million. FMC estimated that the cost would be $48.8

[180] UP Reply Workpaper GM/HW 483.

million, but FMC failed to provide any support for its reduced estimate.[181] Because the burden of proof for initially supporting its estimate is on FMC, we use UP's cost for this segment of line.

2. Electric Power for Signals

The parties disagree on the number and unit cost of electrical connections that would be needed for signals. UP claims that the average installation cost would be $3,000 per location and that these costs would need to be incurred at 2,380 locations. FMC argues that UP's estimate is unsupported and conflicts with the connection cost of $1,000 per signal contained in UP's workpapers.[182] FMC also claims that many of the signals included by UP do not require power.

It is true that UP did not specify or document its source for a connection cost of $3,000 per signal, and included a cost of $1,000 per connection in its workpapers. However, FMC fails to document how it developed its lower count of signals needing power. Thus, we use the number of connections proposed by UP and the $1,000 per connection average cost figure, for a total cost of $2,380,000.

3. Electric Locks

Electric locks are safety devices used on hand-thrown main line switches to prevent trains from accidentally being switched from the main line. UP would have the ORR install electric locks to prevent local operations from interfering with main line trains. UP contends that 206 switches would need locks, at a cost of $65,728 per lock. FMC agrees that electric locks would be needed, but only at 125 locations. Moreover, FMC states that UP's cost figures contradict the $8,000 per lock figure that UP furnished during discovery.

We use FMC's switch lock costs, which were developed from UP information provided in discovery. However, we find no justification on the record for FMC's claim that only 125 locks would be needed. In the absence of support for FMC's evidence, we use UP's number of required locks.

4. Dispatching Center

The parties agree that the ORR would need a dispatching center. UP included unit costs of $686.75 per track mile, based on its experience installing a dispatching system at UP's Harriman dispatching center. Applying this unit cost to the ORR's signaled track miles, UP developed a total cost of $3.9 million.

FMC accepted UP's unit costs, but deducted mileage for track sections and industrial leads that do not interface electronically with the dispatch center. FMC estimated that the dispatching center would cost $3,710,500.

We use FMC's evidence. Tracks that are not connected to the dispatch center should not be included in the development of costs for this item.

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[181] FMC Reply Pattison Workpaper 4831 indicates that a spreadsheet was developed with this cost, but we are unable to find the data.

[182] UP Workpaper RG/AS 392.

5. Electrode Regenerative Repeaters

The parties agree on the cost of the circuitry and repeaters, totaling $15.3 million.

6. Future CTC Requirements

UP maintains that the ORR's CTC system should be built to accommodate all future traffic. FMC asserts that the CTC system it proposes for the ORR could handle anticipated traffic levels over the 20-year SAC analysis period.

The parties configured the ORR to handle the traffic levels which the ORR would encounter during the 20-year analysis period. Because the ORR has sufficient track capacity to provide service during the 20-year period, and UP has not shown why additions are needed, we will not include additional costs for CTC to accommodate future traffic levels.

7. Defect Detectors

UP states that it agrees with the unit cost and number of hot box detectors proposed by FMC. However, UP's cost estimate is slightly higher ($14,734,000 compared to $14,623,800). In light of the indicated agreement, we accept the lower cost estimate.

8. Slide Fences

Slide fences warn trains that a landslide has occurred. UP included the materials and labor cost ($200 per linear foot) for 144,250 feet of slide fences ($28.9 million). FMC maintains that the ORR would not need slide fences. It claims that slide fences are expensive to build and maintain, are not fool proof, and their function can be accomplished in other ways. As an alternative to slide fences, FMC assumed that the ORR would operate trains at slow speeds in cuts that would be most susceptible to slides. While not attempting to quantify the impact on operations, FMC states that the additional time consumed by these slower operations would not be significant. FMC also claims that the ORR would increase track inspections during times that problems are prone to occur.[183]

We find that the ORR would need slide fences. It is a common railroad practice to use slide fences in areas prone to landslides. FMC has not presented sufficient evidence that its alternative to installation of slide fences would be feasible. It also has not attempted to quantify the impact of slower train operations on the ORR operations.

9. Wind Detectors

Wind detectors provide warning against high wind gusts that pose a serious risk to trains carrying high-value freight (double-stacks and autoracks). UP would install 15 wind detectors, at a cost of approximately $25,000 per detector, for a total investment of $375,000.

FMC did not include investment costs for this equipment, claiming that the ORR would rely on National Weather Service (NWS) broadcasts of high wind warnings. However, FMC has not

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[183] Slides tend to occur during periods of heavy rain, seismic activity, heavy snowfall, and during the Spring thaw.

shown that NWS broadcasts would provide the very localized information provided by on-site wind detectors. Indeed, we note that both major western railroads use wind detectors. In light of the relatively minor investment required, we find that these costs should be included.

10. Microwave Communication System

UP estimates that a communication system would cost $106.1 million, compared to FMC's estimate of $78.5 million. The parties' differences are discussed below.

a. Engineering Costs

FMC correctly points out that UP has double-counted the engineering costs for its major telecommunication sites. Engineering costs are included as a separate cost category, *see,* section K, *infra.*

b. Demolition Costs

FMC notes that UP developed communication costs based on the cost of replacing an existing telecommunication facility rather than the cost of installing a new facility. Consequently, tower removal and building cleanup costs — costs that would not be incurred for new construction — are embedded in UP's estimates. We agree with FMC's removal of demolition costs from UP's estimate.

c. Microwave Locations

UP maintains that the ORR would need 146 telecommunication sites and 8 separate offices. FMC agrees that 146 sites would be needed, but asserts that 8 sites could serve as both an office and a microwave tower location. FMC observes that UP's workpapers show that UP's own telecommunication office sites also contain microwave towers. We agree with FMC that an office site could double as a microwave tower site.

FMC also argues that only 5 offices would be needed. UP's workpapers contain references to two microwave systems, consisting of 312 and 112 towers, respectively. The 312- tower system has 12 offices (a 1:26 ratio) and the 112-tower system has 4 offices (a 1:28 ratio). Based on this evidence, we find that FMC's estimate that the ORR would need only 5 offices (a 1:29 ratio) is superior to UP's evidence (a 1:18 ratio).

11. Automatic Equipment Identification

FMC would have the ORR invest $535,500 for 17 automatic equipment identifiers (AEI) at 6 locations[184] and $285,500 for computer equipment to help track and manage the ORR's freight

[184] FMC would have the ORR locate AEIs only at the major interchange points of Proviso (Chicago), Granger, Albina, Kansas City, Shawnee Jct., and North Platte.

cars. Based on its own experience, UP would have the ORR invest $5,500,000 for 110 AEIs at 78 locations along the ORR, including 12 interchange points.[185]

FMC argues that UP has overstated the number and cost of AEIs. However, FMC does not provide any probative evidence supporting its cost per AEI or show why UP's cost is excessive. In addition, FMC does not show why AEIs would only be needed at 6 "major" interchanges and not at all interchange points.[186] Furthermore, it is inappropriate to assume, as FMC does, that other railroads would supply AEI equipment for the ORR's use. Therefore, we use UP's evidence on the cost of procuring AEIs for the ORR. Although UP included costs for 110 AEIs, its workpapers (RG/AS 139) show a need for only 108. Therefore, our restatement reflects a cost for 108 AEIs or $5.4 million.

12. Railroad Crossings

The parties agree on the cost and amount of signaling that would be needed at railroad crossings.

13. Switch Heaters

FMC developed its estimate on the cost for installing switch heaters from UP's workpapers. While there is a minor discrepancy between the parties' cost estimates for this investment, we use UP's estimate as it reflects the least-cost option.

I. Buildings and Facilities

UP's evidence included $616.8 million for investment in buildings and facilities, compared to FMC's estimate of $207.8 million. We discuss the component parts of these estimates below, and our results are summarized in the following table.

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[185] UP also included $960,000 for computer software. However, because both UP and FMC included computer software for AEI as an operating expense, we have excluded UP's costs here as a double count.

[186] As shown in UP Reply Map No. 27, the ORR would have many more interchanges with other railroads.

Table C-6

Building and Facility Investment ($ millions)			
	UP	**FMC**	**STB**
1. Operating Facilities	$389.9	$101.6	$177.5
2. MOW Facilities	19.4	3.6	19.4
3. Auto Facilities	18.0	8.5	10.6
4. Intermodal Facilities	146.8	94.1	103.7
5. Gen. & Admin. Bldg.	0.0*	0.0*	4.7
6. Soda Dome	2.7**	0.0	2.7
Total	**$574.1**	**$207.8**	**$318.6**

* FMC and UP assumed that G&A buildings would be leased.
** UP argues that it contributed $2.7 million to the construction of the soda dome, but it has not included those costs in its spreadsheet.

1. Operating Facilities

Table C-7

Operating Facilities ($ millions)			
	UP	**FMC**	**STB**
Loco. Facilities	$261.8	$75.8	$110.1
Car Facilities	$72.4	$25.8	$35.1
Crew and Office Bldg.	$55.7	**	$32.3
Total	**$389.9**	**$101.6**	**$177.5**

** FMC assumed that buildings would be leased.

a. Locomotive and Car Repair Shops

In its opening evidence, FMC simply stated that repair facilities would be located at various points along the ORR.[187] FMC provided no evidence to show that the facilities that it included could accommodate all of the maintenance work that would be needed, and no support for its cost estimate for constructing such facilities.

UP maintains that the ORR would need six large and four smaller locomotive repair facilities, as well as eight car repair facilities. UP based the design and cost of the major locomotive repair facilities on its Hinkle, OR facility,[188] and it developed two types of car repair facilities — a 3-track and a 2-track facility. UP states that it would cost approximately $43 million to replicate its Hinkle locomotive facility, approximately $7 million to build a 3-track car repair facility, and $5 million to construct a 2-track facility. On rebuttal, FMC argues that UP has significantly overstated the cost of the large locomotive servicing facilities and the car repair shops.[189] FMC points out that UP's property reports indicate that the 1995 replacement value of the Hinkle facility was only $14.7 million.[190] FMC also notes that UP's records indicate that the 1995 replacement value of UP's Salt Lake City 3-track car repair facility was only $3.1 million.[191]

While FMC has offered no support for its estimates for locomotive and car repair facilities, it has shown that UP's estimates are significantly overstated. Therefore, we have restated UP's evidence based on the information contained in UP's records that were produced during discovery. We find that in 1997 it would have cost approximately $15.1 million to construct a Hinkle-type locomotive repair facility and $3.2 million to build a Salt Lake City-type car repair facility. Based on these estimates, we find that it would cost a total of $110.1 million for locomotive repair facilities and $35.1 million for car repair facilities.

b. Crew and Office Buildings

As discussed in Appendix D, FMC has not supported its leasing costs. Although FMC assumed that buildings would be leased and UP assumed that they would be purchased, both agree on the cost of constructing buildings[192] and the amount of space each employee would require. Thus, we have developed the investment cost in these buildings based on the agreed-upon factors and the number of personnel that would require crew or office space.

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[187] FMC Open. V.S. Stern at 10-15.

[188] UP's main line fueling and sanding facilities are located at Chicago, Kansas City, North Platte and Portland (Albina). UP's schematic of its Hinkle-type facility shows that fueling and sanding areas are included in the yard design, and thus in the cost.

[189] FMC does not contest UP's estimates for the smaller locomotive repair facilities. In the absence of FMC rebuttal evidence on these facilities, we use UP costs for these smaller facilities.

[190] FMC Reb. V.S. Burris, Exh. 12, at 4; workpaper WP 5167.

[191] FMC Reb. V.S. Burris, Exh. 12, at 8; workpaper WP 5159.

[192] The parties agree that crew buildings and furnishings (which have not been included elsewhere) would cost $136 per square foot to construct. Not including furnishings (which are included in operating expenses), office buildings would cost $72.67 per square foot to construct.

2. Roadway Buildings for MOW Crews

Roadway buildings support and house the MOW operations. FMC estimated the costs of such buildings for the ORR at $3.6 million, while UP estimated that the ORR would need to spend $19.4 million for such buildings. FMC asserts that UP proposed an excessive number of buildings containing unnecessary amenities. However, FMC provides no evidence that can be used to adjust UP's evidence and no support for its own cost estimates. Therefore, on burden-of-proof grounds we accept UP's estimate of $19.4 million.

2. Automotive Facilities

Table C-8

Automotive Facilities ($000)			
	UP	**FMC**	**STB**
West Chicago	$5,371.2	$1,774.7	$2,605.9
Kansas City	7,000.0	2,323.0	3,475.8
Portland	5,597.1	4,366.0	4,528.1
Total	**$17,968.3**	**$8,463.7**	**$10,608.8**

UP and FMC agree that the ORR would need to construct facilities in West Chicago, Kansas City and Portland to handle automobile traffic. The parties disagree on the size and cost of such facilities. UP claims that the yard area proposed by FMC would be too small to handle the ORR automotive traffic. UP would increase FMC's cost figures for automobile facilities by the ratio of its proposed yard size to FMC's proposed yard size.

While we have used UP's proposed yard size (*See*, Appendix B), we find that it is inappropriate to increase all of FMC's costs for automobile facilities by the yard-size ratio suggested by UP because certain items of investment (*e.g.*, auto ramps) are independent of the size of the yard. Thus, in restating the evidence, we apply UP's ratio only to those investments (*e.g.*, perimeter fencing) that vary with yard size. Below we discuss the evidence related to disputed unit costs associated with certain investments.

a. Paving

UP developed the cost for paving based on *Means* figures for small sites. FMC argues that UP's estimate is overstated and that a more appropriate estimate can be obtained using *Means* figures for roadways and large paved areas. Because paving would be fairly extensive, we agree with FMC that the *Means* cost figures for large paved areas is more appropriate.

b. Grading

The parties agree on the amount of grading per acre that would be necessary.[193] UP estimated an $8 per cubic yard cost, compared to FMC's estimate of $7 per cubic yard. We accept UP's cost estimate. FMC provided no support for its estimate and, therefore, has not satisfied its initial burden of proof.

c. Drainage Pipe

The parties disagree on the cost of drainage pipe. UP used a $53 per linear foot price, compared to FMC's $40 per linear foot. We use UP's cost because FMC provided no support for its estimate.

d. Guardrails

UP estimated the cost of guardrail at $20 per linear foot. FMC suggests that, based on *Means,* guardrail would cost only $13 per linear foot. We accept FMC's cost figure, as *Means* is an acceptable source for estimating costs.

e. Lighting

UP estimated that outdoor lighting would cost $27,990 per acre, compared to FMC's estimate of $8,500 per acre. UP contends that each acre to be illuminated would require four poles, each with four 1,000-watt lights. This estimate was based upon an "isocandle curve" chart prepared by UP. UP also included costs associated with primary wiring and transformers.

FMC claims that only one pole per acre, containing four 1000-watt lights, would be needed, based upon a computer model calculating the number of foot-candles required to meet the industry recommendations of the Illuminating Engineering Society of North America (IESNA) of five foot-candles for building exteriors and yards. FMC further claims that wiring and transformer costs should be excluded, because these costs are traditionally supplied by the local power company. However, FMC offered no evidence to support its claim that these costs would be absorbed by local power companies.

We use FMC's evidence, which is based on IESNA standards, as UP has not shown that the IESNA standard would be inappropriate for the ORR. However, we accept UP's evidence that transformer costs and primary conductor costs would need to be incurred by the ORR.

f. Auto Ramp

The parties disagree on the cost for an adjustable auto ramp. FMC's evidence included the cost for an auto ramp at each facility. UP indexed the cost of FMC's facility, including the auto ramp, based on the ratio of its proposed yard size to FMC's proposed yard size. As discussed above, such an adjustment is inappropriate because each yard would only require a single ramp, which is already included in FMC's costs.

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[193] The parties estimated these grading costs separately from grading for the roadbed.

g. Automobile Railcar Storage

UP claims that space must be provided within the facility for automobile railcar storage. FMC claims that it would be more efficient to provide for railcar storage at yards adjacent to the loading facilities, but FMC has not shown that there would be sufficient space for storage. We cannot accept FMC's unsubstantiated assumption. Therefore, we accept UP's assumption that storage space must be provided within the automotive yard facility.

h. Security Fencing

The parties agree on the cost per acre of security fencing.

3. Intermodal Facilities

Table C-9

Intermodal Facilities ($000)			
	UP	**FMC**	**STB**
Global II	$48,640.1	$29,470.0	$29,012.8
Global I	39,596.1	27,000.0	32,196.2
Chicago	25,722.3	12,269.0	14,158.8
Kansas City	10,444.9	12,520.0	13,459.7
Portland	22,418.3	12,841.0	14,888.9
Total	**$146,821.6**	**$94,100.0**	**$103,716.4**

As it did for automobile facilities, UP increased FMC's cost estimates for intermodal facilities by the ratio of its proposed yard size to that proposed by FMC. Because we find that not all investment in these facilities would be dependent on the size of the yards, we have adjusted UP's cost figures to correct for this overstatement. Furthermore, as discussed below, we find that UP has overstated the unit cost associated with certain items of yard investment.

a. Concrete Pavement

FMC used a cost of $32 per square yard, versus UP's $36 per square yard estimate. We use FMC's cost, which is based on *Means*.

b. Grading

As discussed above, FMC used a cost of $7 per cubic yard for grading without providing any explanation. In the absence of support for FMC's estimate, we use UP's $8 per cubic yard estimate.

c. Drainage Pipes

Again, FMC provided no support for its $40 per linear foot estimate for drainage pipes. In the absence of support, we accept UP's $53 per linear foot estimate.

d. Asphalt Paving

UP developed the cost for paving based on *Means* figures for small sites. FMC argues that UP's estimate is overstated and that a more appropriate estimate can be obtained using *Means* figures for roadways and large paved areas. Because paving would be fairly extensive, we agree with FMC that the *Means* cost for large paved areas is more appropriate.

e. Craneway Pavement

Based on *Means*, FMC used a $58 per square yard estimate for paving craneways. Because *Means* is an appropriate source for construction estimates, we use FMC's evidence.

5. General and Administrative Buildings

The parties agree that 225 square feet of space would be needed for each general and administrative (G&A) employee. Based on the agreed-upon cost per square foot for constructing buildings ($72.67) and the number of G&A employees we have found would be needed, the ORR would need to expend $4.7 million to construct buildings for G&A personnel.

6. Soda Dome

The soda dome at the port of Portland is used for transloading soda ash from railcars to ocean-going vessels for export. UP states that it contributed $2.65 million toward construction of the dome in exchange for a 10-year lease of $240,000 per year. FMC assumed that the ORR would not need to invest in this facility, but does not explain why the ORR would be allowed to use this facility without contributing to its construction. Because the facility would need to be used to export the soda ash carried by the ORR, we include investment for construction of this facility.

J. Mobilization

Mobilization costs reflect the cost of assembling equipment, personnel and facilities at designated places so that construction may commence. UP included $304.5 million (3.3% of construction costs) for mobilization.[194] UP contends that a construction project of the ORR's scope, with most of the work occurring in remote areas, would incur significant costs to mobilize equipment, materials and personnel. Offices would have to be set up at railheads and other construction sites to coordinate the construction effort. Massive quantities of construction machinery would have to be acquired by the ORR's contractors and moved long distances to the job sites.

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[194] UP claims that this is a conservative estimate and that mobilization costs accepted in recent proceedings have been nearly 5%.

FMC agrees that some mobilization costs would be incurred, but disagrees with UP on the magnitude. FMC relied on *Means* to estimate these costs, adjusting them for the specific requirements of the ORR. FMC asserts that railheads used for mobilization would be converted to yards for the ORR and equipment resold upon completion of construction. Below we discuss specific mobilization costs.

Table C-10

Mobilization Costs ($000)			
	UP	**FMC**	**STB**
1. Field Offices	$292.0	$148.0	$292.0
2. Equipment	14,279.0	9,494.0	9,494.0
3. Rail & Work Trains	71,871.0	38,341.0	49,921.0
4. Bridges	46,519 0	6,226.5	29,837.2
5. Culverts	435.8	173.1	173.1
6. Tunnels	4,525.0	4,525.0	4,525.0
7. Performance Bond	68,641.5	28,255.7	40,068.7
8. Demobilization	103,281.7	0.0	22,160.7
9. Resale Value			
Rail Trains	(1,600.0)	(1,600.0)	(1,600.0)
Work Trains	(3,400.0)	(3,400.0)	(3,400.0)
Rail Plant Trackage	(300.0)	0.0	0.0
Ballast Staging Area	(86.0)	0.0	0.0
Totals	**$304,459.2**	**$82,163.3**	**$151,471.7**

1. Field Offices

UP and FMC agree on the cost for building a field office ($4,000), but disagree on the number of offices that would be needed. UP claims that 58 offices would be needed, compared with FMC's estimate of 22. Because FMC failed to provide any support or documentation for its estimate, we accept UP's field office count.[195]

[195] The parties agree that $60,000 would be needed for staging areas. This cost is included in the mobilization cost for field offices.

2. Equipment

UP based its cost estimate for mobilizing earthwork equipment on an undocumented discussion with a contractor. FMC used *Means* figures to estimate the mobilization cost for heavy earth-moving equipment. FMC modified the estimate to reflect the increased distances traversed by the equipment during construction. Because *Means* is a recognized source for developing estimates for construction costs and UP has not shown that those costs are inappropriate, we use FMC's estimate.

3. Rail and Work Trains

UP and FMC agree on the cost and number of rail-carrying and work trains (cars and locomotives) that would be needed. FMC claims that the mobilization costs associated with installing rail at staging areas would be unnecessary because the staging areas and the track would be converted to permanent use as rail yards following construction. Thus, according to FMC, no mobilization costs would be incurred because the track would not be installed only for construction, but rather would be a permanent installation. We find that FMC's assumption that rail head yards would be located where they could be converted to permanent use as yards is feasible and that no mobilization costs would therefore be associated with installing track at temporary yards. We have, however, included mobilization costs for the specialized trains needed to deliver track and to transport other construction materials.

4. Bridges

The parties agree on the mobilization costs associated with erecting large bridges.[196] For other bridge mobilization costs, UP developed its estimate based on a bridge count of 1,693[197] and costs based on an undocumented discussion with a contractor. For purposes of estimating bridge mobilization costs, FMC assumed that 1,252 bridges would be built and used *Means* figures to estimate the mobilization costs associated with bridge construction.

We use FMC's bridge mobilization unit cost. UP's mobilization cost is undocumented, whereas *Means* is an authoritative source for construction costs. We use a bridge count of 1,252 to compute total costs because this is the number of bridges the parties agree would be needed.

5. Culverts

The parties agree that culvert mobilization costs should match the earthwork equipment mobilization cost. We calculate a culvert mobilization cost based on our use of FMC's earthwork equipment mobilization factor.

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[196] Bridges over 700 feet in length are considered large.

[197] UP's spreadsheets show 1,252 bridges on the ORR's lines. The difference between the two bridge counts apparently reflects UP's contention that each set of tracks would require a separate bridge.

6. Tunnels

The parties agree on mobilization costs for tunnels.

7. Performance Bonds

Based on discussions with a contractor, UP estimated that performance bonds would amount to 0.5% to 0.75% of total construction costs. UP used the high-end of the range, while FMC applied the low-end. Because the contractor did not give a precise estimate, we cannot assume that either extreme of the range would represent the price at which a performance bond could be procured. Therefore, we use the mid-point of the range as a reasonable estimate.

8. Demobilization

Demobilization encompasses work done at the end of the project to remove facilities used during construction. Specifically, the staging areas for the construction effort would have to be dismantled and sites made usable for other purposes, and rail and work trains would have to be sold. The parties' evidence on demobilization costs is meager. UP estimated that demobilization costs would be 50% of the mobilization costs. FMC claims that some demobilization costs would not be incurred because staging areas (railhead yards) used during construction would be used as yards for the ORR. It also states that demobilization is a double count, but provides no support for that assertion.

While we agree that the railhead yards can be reconfigured and reused as yards, there would be other demobilization costs, such as relocating equipment used in earthwork, track work, bridge, culvert, and tunnel construction. Because FMC provided no support for its contention that these costs are a double count,[198] we apply UP's demobilization percentage to all mobilization items except track (the reuse of railhead yards) and performance bonds.

9. Resale Values

The parties agree on the resale value of rail and work trains, but disagree on the value of the track serving rail plants and ballast staging areas. Because we accept FMC's position that railhead yards used during the ORR's construction process would be used for operational yards, the track at the rail plants and ballast staging areas would not be sold at the end of the construction process.

K. Engineering Costs

Engineering costs are the expenses associated with planning, designing, and managing construction of the ORR.

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[198] We note that in prior cases, while a separate cost has not been included for demobilization, mobilization costs represented a higher percentage of construction costs than we have accepted here.

Table C-11

Engineering Costs			
	UP	FMC	STB
Design Engineering	5.00%	5.00%	5.00%
Mapping and subsurface investigation	1.00%	1.00%	1.00%
Design services during construction	0.50%	0.50%	0.50%
Resident engineering/project mgt.	5.80%	2.50%	5.15%
Total	**12.30%**	**9.00%**	**11.65%**

The parties agree that design engineering, mapping and subsurface investigation, and design services during construction would add 6.5% to total construction cost. They disagree on the percentage for resident engineering and project management. UP claims an additive of 5.8% of the total cost (1.9% for inspection and 3.9% for construction management) would be required, compared to FMC's estimate of 2.5% (1% for inspection and 1.5% for construction management).

1. Inspection

UP included 1.9% for inspections based on its witness' experience in construction management and *Means,* whereas FMC claims that 1% for inspection would be adequate. According to UP, a considerable force of field engineers assigned to inspection would be needed because of the size of the construction project. FMC claims the level and frequency of inspections would be determined by the ORR. If the ORR were willing to accept the greater risk associated with a smaller inspection force, it could reduce inspections and costs. FMC fails to support its lower inspection percentages and does not explain how the additional risk associated with fewer inspections would be absorbed by the ORR. Thus, we use UP's evidence, which is based on a recognized source.

2, Construction Management

UP derived its total engineering/management component by averaging *Means* data and recommendations from the Corps of Engineers. It selected a 3.5% estimate for engineering and management, based on the *Means* range of 2.5% to 4%. UP states that the Corps of Engineers recommends a total engineering/management component of 6.2%. UP subtracted its 1.9% inspection estimate from the 6.2% to yield a construction management total of 4.3%. It averaged the 3.5% (from *Means*) and 4.3% (from the Corps) to get 3.9%.

While FMC claims that the construction management additive would be 1.5%, FMC does not explain or provide any support for its estimate. Accordingly, we use UP's figures, but restate UP's estimate to reflect the midpoint (3.25%) of the *Means* range, because UP did not explain why the upper end of the range was selected.[199] We also reject UP's use of Corps of Engineers data, because we cannot determine what portion of that estimate was attributable to inspection costs.[200]

L. Contingencies

Contingencies provide funds for unknown events that typically occur during the construction of a project. Contingency funding is a normal part of construction projects. UP developed a contingency percentage (12.5%) for the entire construction project, whereas FMC provided contingency estimates for each asset category. UP argues that the design is in an early stage of development with many unresolved design and construction issues. FMC would limit contingencies because the wealth of information available about the UP system decreases the uncertainty associated with construction. FMC argues that the development of the SAC analysis is more like a feasibility study, because the wealth of known information permits specific estimation of what the construction of the hypothetical ORR would entail.

Both parties' arguments are flawed. UP incorrectly assumes that the design of the ORR is in an early stage. To the contrary, the SAC analysis includes funds for all aspects of design and planning. Thus, a contingency to account for changes between initial planning and final design is inappropriate. Rather, a contingency fund would be needed only to fund unforeseen costs (such as increased costs due to bad weather conditions) that might occur during construction. UP provides no evidence showing that large-scale railroad projects require contingency percentages in excess of those shown in *Means*.

FMC's argument that contingencies would be lower than on a normal project because the ORR would follow the existing UP route is also flawed, and we have previously rejected similar arguments.[201]

In previous SAC cases (including cases where UP itself has advocated the use of a 10% factor), we have found that a 10% contingency is appropriate for the construction of a rail system. Indeed, in this proceeding the general references relied upon by the parties indicate that a 10% contingency is a reasonable estimate to account for uncertainties that may occur during the construction process. Thus, as in prior cases, we will use a 10% contingency factor here.

APPENDIX D — ORR OPERATING EXPENSES

Operating expenses are the day-to-day costs that would be incurred to equip, run and maintain the ORR. FMC contends that the ORR would be a highly efficient railroad with highly productive employees requiring only minimal supervision. UP contends that the ORR could not achieve the supernormal operating efficiencies claimed by FMC — efficiencies that would make the ORR three times as efficient as the average Class I railroad.[202] By limiting the ORR's equipment and labor to

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[199] While the individual construction project would determine the exact cost of construction management, there is no evidence to suggest that either end of the range would be the cost that would be incurred by the ORR.

[200] The Corps of Engineers total engineering/management component of 6.2% is not separated into inspection and construction management costs.

[201] *See, McCarty* at 52.

[202] The ORR would be a Class I railroad, as measured by its revenues. *See,* 49 CFR 1201, General Instruction 1-1.

achieve such efficiencies, UP contends that the ORR would be unable to provide the service required by its shippers, *i.e.*, service equivalent to that currently being provided by UP.

Table D-1 summarizes the parties' estimates of the operating costs associated with the equipment and labor that would be needed by the ORR and our restatement of the evidence. Each expense category is then discussed separately.

Table D-1

ORR Operating Expenses (1997 dollars)			
EXPENSE ITEM	**UP***	**FMC****	**STB**
A. Locomotive Lease	$142,927,990	$86,215,565	$141,525,400
B. Locomotive Maintenance	66,156,519***	57,983,832	74,472,208****
C. Locomotive Servicing	240,102,122***	219,810,709	247,442,648****
D. Freight Car Lease	58,387,124	48,492,315	58,387,124
E. Freight Car Maintenance	2,965,951***	5,209,321	5,226,507****
F. Intermodal Car Lease	61,369,715	58,686,228	61,369,715
G. Intermodal Terminal	35,038,156	9,154,683	9,154,683
H. Private Car	40,168,661	41,103,681	40,168,661
I. Training	69,479,653	0	52,424,840
J. Operating Personnel	391,526,898	178,711,305	253,642,832
K. General & Administrative	182,887,189	22,767,594	154,381,910
M. Loss & Damage	277,4158	2,774,158	2,774,158
N. Insurance	71,964,281	40,826,733	59,080,949
O. Ad Valorem Tax	17,450,675	18,070,211	17,450,675
P. Maintenance-of-Way	137,565,715	72,849,205	123,631,000
Q. Soda Ash Dome	240,000	240,000	240,000
Total Operating Expense	**$1,521,004,808**	**$862,895,539**	**$1,301,373,310**

* UP Reply Klick/Kent electronic workpapers, folder DCF, Oland-op.wk4.
** FMC Reb. Burris electronic workpaper, folder SAC and DCF, Oland-op.wk4.
*** UP includes the labor costs associated with these activities in "J. Operating Personnel."
**** Includes labor costs for these activities.

A. Locomotive Leasing

The parties agree on the costs of leasing specific types of locomotives, but disagree on the number of locomotives that the ORR would need to lease.

Table D-2

Number of Locomotives			
Loco. Type	**UP**	**FMC**	**STB**
GE AC4400	950	574	950
SD40	238	139	202
SW1500	44	29	44
TOTAL	**1,232**	**742**	**1,196**

1. Line-haul Locomotives

FMC developed the number of line-haul locomotives that the ORR would need for each major group of traffic (coal, grain, intermodal, automotive, soda ash, general freight and phosphate rock) using simple arithmetic calculations. In general, FMC calculated the number of hours locomotives would be needed by multiplying the transit time for each train by the number of trains per year and then by the number of locomotives in the trains.[203] The total number of locomotives was determined by dividing the total hours that locomotives would be needed by the number of hours in a year, and then dividing that result by 0.93 to reflect that each locomotive would be available for service only 93% of the time.

UP criticizes FMC's evidence, arguing that a simple arithmetic calculation fails to account for peak traffic periods. According to UP, only by reviewing the flow of traffic throughout the year can an accurate estimate of the required locomotive fleet be determined. UP developed the locomotives that would be required by the ORR by reviewing the base year traffic flows. It then proposed that the ORR procure the number of locomotives that would be needed to handle traffic during the peak two days of the year. UP contends that planning for peak periods reflect the real world constraints on a railroad.

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[203] In its opening evidence, FMC determined the number of hours locomotives would be needed for coal traffic by computing the annual number of carloads moving between each coal origin and destination pair and dividing by 115 to determine the annual number of trains. It then estimated the transit time for each origin/destination, added 12 hours for servicing and repositioning of the consist, and multiplied the resulting total trip time by the annual number of trains times 2 (the number of locomotives needed to pull 115 cars). On rebuttal, FMC determined the average size of trains moving between each origin and destination, but assumed that no trains would contain more than 115 cars. However, the record indicates that many shippers currently move trains containing more than 115 cars.

FMC contends that UP's locomotive count is overstated and that the inventory of locomotives need not be sufficiently large to accommodate absolute traffic peaks. FMC does not, however, address UP's criticisms of its method of estimating locomotives.

While recognizing that there are times when railroads do not have sufficient locomotives to handle all peak traffic requirements, we nonetheless find that FMC's mathematical approach to developing locomotive requirements fails to demonstrate that even normal service requirements could be met. For example, many coal shippers that would be served by the ORR would require trains containing more than 115 car trains. But, in order to limit the number of locomotives, FMC's plan limits coal trains to no more than 115 cars, a plan that it has not shown would be acceptable to all shippers. In order to include traffic in the ORR traffic group, the ORR needs to be ready to provide the service that those shippers expect. A review of UP's workpapers shows that coal trains containing varying numbers of cars are needed to provide service to ORR customers.[204] For the daily intermodal service from Kansas City to Seattle, FMC's arithmetic computation calculates that 3.9 locomotives could provide this service. But, as FMC's evidence shows, each train would require three locomotives and take 75 hours (63 hours transit time plus 12 hours to turn and service the locomotive) to make the trip.[205] Clearly, FMC's calculation that only 3.9 locomotives would be needed is flawed when a single, 3-locomotive train takes over three days to complete the trip and daily service is contemplated.

In general, FMC's method for calculating locomotive requirements consists of only a tabulation of decimal equivalents of locomotives required. Moreover, it assumes that the number of locomotives needed would remain constant throughout the year, with peak periods for some traffic corresponding with slack periods for other traffic, thereby allowing the ORR to switch locomotives between traffic groups, an assumption not supported by the record. Furthermore, FMC does not recognize that locomotives would not always pull the maximum number of cars or that specific service requirements would necessitate an inventory of more locomotives than developed by FMC's calculations.

Because FMC has failed to demonstrate the feasibility of its estimate, we generally use UP's evidence on the number of line-haul locomotives that would be required. We adjust UP's estimate, however, to remove the costs associated with locomotives dedicated to maintenance activities. All costs for the repair of damaged assets (operating maintenance) have been included in MOW costs and all costs associated with the replacement of worn-out assets (program maintenance) have been included in investment costs. Therefore, we exclude the 36 SD40 locomotives that UP would include to move maintenance materials because the inclusion of such costs here would result in a double count.

2. Switching Locomotives

FMC would supply the ORR with 29 switch engines, while UP (based on its current operations) would provide 44 engines. UP insists that FMC's proposed operations would fail to provide adequate switching at freight yards and terminals.

FMC's rebuttal argument was limited to switching operations at two locations. Where UP had proposed that the ORR provide five SW1500s for around-the-clock switching at three ramps in the

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[204] While FMC argues on rebuttal that it had adjusted its opening evidence to take account of actual train size, FMC's rebuttal evidence simply assumed that the number of cars in a train for each origin/destination pair would be equal to the largest train that had moved between those points.

[205] FMC Open. Workpaper WP2219.

Chicago intermodal yards, FMC posits one SW1500 at each of the three intermodal facilities. Thus, ORR locomotives would perform only one switch per outbound train, and the adding of cars to outbound trains would be performed by the contract ramp operator, using a remote control locomotive.

FMC also insists that UP has overstated the number of switch engines that would be required in Albina. FMC maintains that most switching at Albina would be handled by a contractor and, thus, there would be little switching for the ORR to perform. Also, according to FMC, through trains would be handled at the interchanges by the connecting carriers. Thus, FMC asserts that the two SW1500s provided for in its plan would be sufficient.

We find FMC's explanations with regard to the switching required at Chicago and Albina unpersuasive. Even if, as FMC suggests, a contractor would provide the required switching, we have found no evidence that FMC has included funds to pay for this service. Absent a showing that FMC has included the cost to cover the work to be performed by a contractor, the ORR would need to have locomotives to provide the required service. Furthermore, FMC has not explained why connecting carriers would always absorb the costs associated with interchange. Because we have no evidence that only 29 engines can provide the switching that would be required, we use UP's figure of 44 switch engines for the ORR.

B. Locomotive Maintenance

To develop the cost of maintaining line-haul locomotives, FMC relied on evidence submitted in the *West Texas* case that a maintenance contract on AC4400 locomotives could be procured for \$0.65 per locomotive unit-mile (LUM)[206] and maintenance on the SD40s would be \$78,000 annually. FMC developed switching-locomotive maintenance cost based on UP's 1996 system average of \$0.76 per LUM. UP adjusted FMC's cost evidence by substituting its own higher labor cost for the imputed labor component in the maintenance contract.[207]

We accept FMC's evidence. The maintenance costs in *West Texas* were based on a price quote from General Motors Corporation, Electro-Motive Division (GM) for locomotives similar to those the ORR would use. UP does not question the veracity of this price quote, but would merely substitute its own labor cost for that of GM. But if GM can provide maintenance at a cheaper rate than the railroad could provide itself, the stand-alone railroad would contract with GM for such service. Further, UP does not object, and we see no reason why the use of UP's system average costs for servicing switching locomotives is inappropriate.

C. Locomotive Servicing

Servicing consists of the labor costs and materials associated with adding lube oil, sand and fuel to locomotives. FMC estimated that it would cost \$0.079 per LUM to service locomotives.[208] This estimate was developed from UP's 1996 R-1 report. UP developed servicing costs by

[206] FMC indexed the maintenance cost to a 1997 level. Both FMC and UP also used the \$311,944 cost of overhauling locomotives accepted in *West Texas*.

[207] UP included these labor costs in its "Operating Personnel" costs.

[208] For yard locomotives, FMC converted the service cost of \$0.079 per LUM to an hourly cost of \$0.474 by multiplying the cost per LUM by an assumed average yard speed of 6 miles per hour. UP adopted this approach.

substituting an estimate of labor costs from its mechanical department for the labor component embedded in its R-1 data.[209]

We accept FMC's evidence. We cannot verify UP's mechanical department labor cost and UP has not explained why the labor costs reported in its own annual report should not be used to estimate the cost that the ORR would incur in servicing locomotives.

The parties agree on the cost of fuel, lube oil and sand, but developed different expenses due to the difference in the number of locomotives assumed by each party. Our restatement is based on the agreed-upon cost for materials, FMC's use of UP's system-average labor costs, and the number of locomotives we have previously found that the ORR would require.

D. Freight Car Leasing

The parties agree that the ORR would lease the cars necessary to move the ORR's traffic and they agree on the cost of leasing such cars. However, as the following table indicates, the parties do not agree on the number of freight cars that would be needed. FMC would have the ORR lease 8,487 cars at a total annual cost of $49.6 million, while UP would have the ORR lease 10,821 cars at a total cost of $58.4 million.

Table D-3

Freight Car Requirements		
Car Type	**FMC**	**UP**
Plain Box	188	313
Equipped Box	411	731
Plain Gondola	30	220
Equipped Gondola	225	320
Covered Hopper	2,119	2,964
Non-Mechanical Reefer	172	276
Mechanical Reefer	219	198
General Flat	2	6
Other Flat	333	524
Open Top Hopper	3,248	2,961
Multi-level Racks	1,540	2,306
Caboose	0	2
Total	**8,487**	**10,821**

209 UP included the labor costs for locomotive servicing in its "Operating Personnel" costs.

FMC and UP estimated the number of cars based on the cycle time of cars and the number of shipments tendered during peak traffic periods.[210] FMC developed cycle times using average train speeds, free time permitted for loading and unloading, and 12 hours for each time a car would be interchanged between the ORR and another carrier.

UP claims that FMC's approach only accounts for the time a car is being loaded, unloaded, interchanged or in transit, ignoring the time required to assemble empties requested by the shipper, deliver empties to the shipper, and switch loaded cars to assemble a line-haul train. UP contends that the same general approach used by FMC was rejected in *Nevada Power*, 10 I.C.C.2d at 289-290. UP computed cycle times based on its actual experience handling 1996 and 1997 traffic that moved over the part of its system that the ORR would replicate.

FMC contends that UP's cycle-time study must be rejected because it was based on data not available to FMC. FMC also argues that UP's study overstated cycle time to the extent that it included free time beyond that allowed by UP demurrage guidelines. FMC maintains that UP should have either removed the additional time from its study or credited the ORR with revenues from demurrage charges. Finally, FMC contends that UP's cycle-time study inappropriately included movements that the ORR would not handle. It states that there is no way to measure the impact of the additional traffic on the study.

We reject FMC's cycle time and car requirements. FMC's methodology does not properly account for the component of cycle time related to pickup and/or delivery of loaded or empty cars from shippers by local trains. Furthermore, FMC does not take into account the time involved in assembling cars into line-haul trains.

In contrast, UP's cycle time is based on UP's experience serving the shippers that the ORR would serve. This information was contained on data cartridges that were made available to FMC in discovery. FMC's criticism of UP's inclusion of additional free time beyond that allotted to its shippers without accounting for demurrage charges is unpersuasive, since shippers often receive more free time than allowed under the demurrage guidelines.[211] Finally, there is no reason to believe that traffic currently moved by UP, but not included in the ORR traffic group, would skew the cycle-time average. On balance, we find that, because cars actually cycle in the time computed by UP, UP's evidence on the number of cars that the ORR would need is the better evidence of record.

E. Freight Car Maintenance

FMC developed car maintenance expense by calculating the difference between a full-service rail car lease and a lease under which maintenance is provided by the lessee, to derive an annual maintenance cost of $614 per car. As with other operating expenses containing a labor component, UP substituted its own labor cost for that contained in FMC's estimate and developed a higher maintenance cost.[212]

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[210] FMC estimates car requirement for a peak month, whereas UP's estimates are based on the peak two consecutive day period during the peak week of traffic.

[211] Indeed, prior to the expiration of its contract with UP, FMC incurred no demurrage charges for its soda ash traffic. *See also,* FMC Reb. V.S. Stern at 112 ("[d]emurrage is rarely assessed anymore").

[212] UP included labor costs in its "Operating Personnel" costs.

Because FMC's information is based on leases supplied by UP during discovery and the procedure it used to develop maintenance costs has not been shown to be inappropriate, we accept FMC's evidence. UP does not explain why the stand-alone railroad would use higher cost labor to perform maintenance when less expensive labor would be available.

F. Intermodal Car Leasing

The parties agree that the ORR would pay for the use of TOFC/COFC and automobile rack cars on a time-and-mileage basis. FMC included $58.7 million for leasing intermodal cars, while UP included $61.4 million. The difference between the parties' estimates is attributable to the difference in car days developed from their respective car-cycle-time analyses. Because we have accepted UP's cycle-time study, we use UP's lease cost for intermodal cars.

G. Intermodal Terminal Expense

FMC included $8,353,727 to cover the cost of lifting trailers and containers onto, and off of, trains at intermodal terminals and for rubber-wheel interchanges,[213] based on the number of intermodal lifts and rubber-wheel interchanges (and the associated costs for such services) obtained from UP on discovery. UP included $34,237,200 for such services. UP accepts FMC's method of developing these costs, but adjusted FMC's estimate to include administrative costs for operating the intermodal facilities and for over 70,000 additional rubber-wheel interchanges at Chicago. Both parties included $800,956 for loading automobiles.

We accept FMC's evidence. A review of UP's workpapers[214] shows that the administrative costs that UP included would be assumed by the contractor and included in the cost per lift. Furthermore, UP's evidence that an additional 70,000 rubber-wheel interchanges would occur at Chicago is suspect, given that UP had only 16,388 systemwide rubber-wheel interchanges in 1997.

H. Private Car Expense

The parties developed private car expense using UP's 1996 R-1 data. FMC and UP included $41,103,681 and $40,168,661, respectively, for this expense. The differences in cost is due to the parties' different freight car requirements and private car miles. Because we have accepted UP's car requirements, we use its private car costs.

I. Training Costs

UP argues that, as a new railroad, the ORR would incur significant expense in hiring and training employees for various positions. It notes that even if the ORR were to hire employees away from other railroads, it would still have to train them on ORR procedures, equipment, and lines, and if employees were new to railroading, ample lead time would be required to ensure proper training before the ORR could begin service. UP included $69.5 million to cover this initial training. FMC included no costs for initial training, arguing that it would hire UP's experienced labor force that would be displaced when the ORR began operations.

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[213] A rubber-wheel interchange is the movement of TOFC traffic between rail yards by motor carrier.

[214] UP Workpaper CK/JK 000717 and electronic file IMDL-OPX.xls.

We agree with UP that, even if the ORR were able to hire ex-UP employees or other experienced railroad workers, such personnel would still require startup training on the ORR's procedures, equipment, and lines. Because UP provided the only estimate for initial training, we accept its evidence, adjusted to reflect our restated ORR staffing levels.

UP also argues that, like existing railroads, the ORR would need to provide continual training for its employees. UP included $5.5 million to cover the cost of annual training. FMC agrees that the ORR staff would require ongoing training, but argues that staff to handle such training is included in the ORR's human resources department.

In our restatement of the staffing levels for the human resources department, we have excluded training personnel. Therefore, we find that funds for ongoing training are appropriately included under training costs.

J. Operating Personnel

FMC initially proposed that a staff of 66 managers and 1,710 non-management operating personnel could run the day-to-day operations of the ORR. However, FMC provided little or no evidence that the number of personnel it proposed could perform all the duties required.[215] On rebuttal FMC revised its personnel estimates upward in response to UP's criticisms, but inappropriately limited personnel costs by understating the extent of proposed ORR operations,[216] proposing that contractors provide service,[217] ignoring costs,[218] or merely asserting (without support) that fewer personnel than proposed by UP could accomplish the work.[219]

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[215] *See,* FMC Open. V.S. Stern at 16-17.

[216] For example, FMC's evidence on the number of personnel that would be needed for dispatching contradicts other evidence on ORR operations. For purposes of determining the number of personnel needed, FMC argues that one dispatcher could handle the single secondary manifest train and limited grain train service east of North Platte, another could handle the traffic from North Platte to Fremont and one could handle the traffic from Fremont to Chicago. But operations east of North Platte consist of not only the secondary train moving between Fremont and Chicago, but also two primary manifest trains daily in each direction, as well as pickup, delivery and interchange services on the line. Furthermore, Chicago and Fremont are major interchange points for hundreds of cars daily (FMC Reply V.S. Stern at 6) and, based on FMC traffic projections, approximately 36 trains daily (consisting of TOFC, automobile, general merchandise and coal) would move over these segments starting in 1998, growing to approximately 74 trains by 2017. UP Reply V.S. Wheeler, Exhibit DRW-1. In addition, FMC's description of "no locals and no yards on the line" between Gibbon, NE and Kansas City is contradictory. FMC elsewhere describes the operation at Marysville (located on this line) as a crew change point where the dispatchers would be responsible for dispatching about 120 trains daily and Kansas City as a major interchange point for the ORR.

[217] *See,* discussion of "Locomotive Leasing," *supra,* noting that FMC has not included costs associated with contractor-provided service.

[218] While FMC agrees that personnel would be needed to distribute and allocate locomotives, freight cars, and train crews, we cannot find where FMC included any costs for locomotive, car or crew management employees. *See,* FMC Reb. V.S. Stern, Exh. GLS 4, 5 and 6 (no reference to such management personnel). Also while providing funds for per diem expenses of management staff on travel, FMC failed to provide any funds to cover the cost of transportation (*e.g.*, air fare).

[219] *See, e.g.*, FMC Reb. V.S. Stern at 89-92.

Because, for the most part, FMC's evidence is unpersuasive, incomplete or contradictory, we find that it has not met its burden of establishing the feasibility of its staffing levels. Therefore, with the exceptions discussed below, we accept UP's evidence regarding the number of operating personnel that the ORR would need.

1. Train Crews

The parties developed estimates on the number of train crew personnel (employees that would operate the line-haul and local trains, and perform switching) and miscellaneous costs (cost for meals and lodging for crews).

Table D-4

Train Crew Personnel			
	UP	FMC	STB
Line-haul	1681	1478	1548
Local	175	136	175
Yard	278	94	278
Total	**2134**	**1708**	**2001**

a. Line-haul Personnel

With little explanation,[220] FMC's opening evidence purported to include 1,311 line-haul employees,[221] but its workpapers show only 904 such employees.[222] UP questioned FMC's evidence and developed its own estimate of the number of line-haul employees (1,681) that would be needed by determining the number of through trains moving between each crew district and assuming each crew would work 250 days per year.

On rebuttal, FMC criticized UP's requirements as excessive, but increased its estimate of line-haul employees to 1,478.[223] We cannot determine how this estimate was derived, nor can we find any support for this estimate in the record. Consequently, we reject FMC's evidence [224] and use UP's evidence, with the adjustments discussed below.

FMC suggests that each crew member would be involved in 270 shift starts per year. FMC explains that each crew would begin its week on duty at home, travel to the other end of the district

[220] FMC Open. V.S. Stern at 16-17.

[221] FMC Open. Burris electronic spreadsheet oland_op.wk4.

[222] FMC Open. Stern Workpapers (WP 2223-2304).

[223] *See,* FMC Reb. Burris electronic file oland_op.wk4 - Operating Lookup Sheet.

[224] FMC argues that UP inappropriately increased train personnel to account for the fact that congestion in the Powder River Basin forces UP to recrew many trains. FMC suggests that, unlike UP, the ORR would not share its track with BNSF and, therefore, would not experience the same delays that UP experiences. However, FMC does not address UP's contention that the ORR would have to contend with BNSF trains on the mine loop tracks. Because significant congestion occurs on the loop tracks, we cannot accept FMC's contention that relief crews would not be needed.

(one shift), rest a minimum of eight hours and travel back home (second shift), making three such round trips per week, 45 weeks per year.

UP argues that crew members would work approximately 3,850 miles per month. Dividing the lengths of the crew districts on the ORR into this 3,850 mile average yields a range of days worked per month by district. Based on this calculation, UP suggests that ORR crews would make only 250 shift starts per year.

UP has not shown how its average miles per month figure was calculated or why this number is relevant to the ORR. As the ORR crew districts have been drawn up precisely so that the crews generally can get back and forth in the allotted time, we do not see the necessity to restrict the crews to only 250 starts per year. We therefore accept FMC's crew starts of 270 per year. On this basis, the ORR would need 1,557 train personnel.

UP's evidence also included crews to move maintenance materials such as ties, rail, and ballast. We agree with FMC that UP inappropriately included those costs. Such costs are either already included in MOW costs (if they relate to operating maintenance) or in investment costs (if they relate to replacement of assets as they wear out). Therefore, our restatement excludes the nine line-haul crew members that UP would include for maintenance.

b. Local and Switching Personnel

FMC's opening evidence did not discuss local train or switching crew requirements, but its workpapers indicated that 88 local and 89 yard personnel were included.[225] UP estimated that the ORR would require 175 local and 278 switching personnel. UP developed these numbers based on the number of local trains, amount of switching that would be required at each yard (local trains would require two crew members and switching operations three crew members) and an assumption that each crew would work 225 days per year.

On rebuttal, FMC challenged UP's evidence and purported to revise its estimates. However, we cannot determine from FMC's evidence how many local and switching train personnel it proposes for the ORR.[226] Therefore, we must reject FMC's evidence. But even if FMC had specified the number of personnel, it is apparent that in certain circumstances it would not provide funding for sufficient personnel. For example, at the Albina Yard, FMC excluded switching crews, suggesting that a contractor would perform all intermodal and automotive switching.[227] As previously noted, however, FMC failed to include any cost for a contractor to provide this switching service.[228] In contrast, UP has provided sufficient evidence for us to verify its development of local and switching service and we accept its evidence.

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[225] FMC Open. Workpapers Stern 295; Burris electronic file oland_op.wk4.

[226] FMC Reb. V.S. Stern, Exh. GLS-4 provides for total train crews, but has no breakdown relative to local and switching crews.

[227] FMC Reb. V.S. Stern at 42.

[228] FMC Reb. V.S. Burris at 106-12 (no indication that contractors would perform intermodal or automotive switching).

c. Miscellaneous Crew Costs

For crew meals and lodging combined, FMC and UP included $6,983,550 and $6,854,025, respectively. Because we generally accept UP's estimate of train crews, we accept UP's evidence on miscellaneous costs, as those cost figures are dependent on the number of crew.

2. Car Inspection and Repair

Under Federal regulations, freight cars must be regularly inspected. The parties agree that the ORR would need to employ freight car inspectors to couple air hoses, check angle cocks, release hand brakes, apply end-of-train devices and perform air tests. FMC estimated that the ORR would require 148 inspectors and 10 foremen. UP estimated that 124 inspectors would be needed plus some unspecified number of additional inspectors to perform the duties of the regular inspectors during vacations. In the absence of a specific staffing estimate from UP, we accept FMC's estimate.

3. Service Design Department

UP included a staff of nine individuals to evaluate the need for additional capacity and to analyze ways to improve the ORR's operations. FMC argues that, with only one yard and one route between any two stations, the ORR would have little flexibility to alter its operations and would have little need for a service design staff. We agree that, because the ORR has been designed to be a highly efficient rail system with the capacity to accommodate projected future traffic growth, there would be little need for a staff devoted to improving efficiency. (We note that if future efficiencies could be realized, they would result in lower future costs or greater revenues than those forecast here — factors that the DCF model does not take into account).

4. Customer Service

Based on the recommendation of its customer service managers and its own current operations, UP proposes a customer service department for the ORR of 270 employees. FMC agrees that a customer service department would be needed, but argues that, based on the simpler operations of the ORR, a staff of only 40 would be required. While UP may require a large staff, FMC argues that the ORR is predominately an overhead railroad requiring little contact with customers and the limited number of local customers would generate few bills of lading. In addition, FMC points out that most of the larger shippers/receivers currently have contracts with third party reporting firms to update their computers automatically from car service information kept by the railroad's central computer system.

Other than the customer service representatives required for FMC's traffic, UP has made no attempt to quantify the duties that customer service representatives would perform based on the ORR's operations and traffic group. In contrast, FMC has reasonably explained why the ORR would need fewer customer service employees than UP might need to support its current operations. Therefore, we accept FMC's figure as the best evidence of record.

5. Operating Materials & Supplies

A variety of materials and supplies (M&S) would be needed by ORR operating personnel — *e.g.*, trucks, miscellaneous tools and equipment, buildings, hand-held radios, end-of-train devices (EOTD), etc. Where the parties agree on the unit cost for M&S items related to staffing levels (a majority of the items), we have restated the cost to reflect the staffing requirements we have accepted.

In its evidence on M&S, UP included costs for seven rerailing cranes. Because FMC did not challenge the inclusion of these cranes, we have included the cost in our restatement. There is also a substantial difference in the parties' cost estimates for EOTDs, due to differences in their respective operating plans. Because we use UP's operating plan, we accept its EOTD requirement.[229]

The parties agree on the cost per square foot for constructing buildings to house operation personnel and on the amount of space each employee would require. UP included the cost for buildings in the ORR's investment base, while FMC, in its electronic spreadsheets, developed a lease cost based on the construction cost and an imputed return on investment equal to the real cost of capital. However, FMC does not explain why it is appropriate to develop lease costs based solely on construction costs with a return on investment limited to the supposed rail industry's real cost of capital of 7.09%.[230] Therefore, we reject FMC's evidence. While accepting UP's method for developing costs for buildings, we note that UP's costs included the cost for furnishings which are included as a separate operating expense item elsewhere.[231] Therefore, we have adjusted building costs to exclude the cost for furnishing buildings and to reflect our restatement of operating staff.[232]

Finally, FMC developed building maintenance cost on a square-foot basis. UP did not include any maintenance/operating costs for these buildings. Therefore, we accept FMC's building maintenance cost, adjusted for the restated staffing levels.

K. General & Administrative Costs

General and administrative costs (G&A) are the overhead costs (*e.g.*, staffing a human resources department) that would be associated with operating the ORR. In its opening evidence, FMC provided no support for its annual G&A expense estimate of $11.6 million. Rather, FMC merely listed the staff positions that it proposes the ORR would need.[233] It made no attempt to show that such a staff could feasibly perform the required work, by either explaining the amount and type

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[229] Because we rejected UP's locomotives associated with the movement of 18 maintenance trains, we have excluded EOTDs associated with these trains.

[230] There is no evidence that a non-railroad lessor would accept a lease payment based on the rail industry's cost of capital. Furthermore, we note that the railroad real cost of capital used in the DCF analysis exceeds 7.09%.

[231] The parties both relied on costs for furnishing from ARZ Office Supplies Catalog. We use the costs from this catalog to develop office furnishing costs based on the staffing levels we have accepted.

[232] We use a $72.67 per square foot figure for building construction costs. Because we are treating the cost for roadway and maintenance buildings as an investment, we include these costs in Appendix C.

[233] FMC Open. V.S. Burris at 37-40 (listing without explanation the personnel and supplies associated with G&A functions).

of G&A work that the ORR staff would need to perform or relating the size of the staff to operations of existing firms. In its reply evidence, UP estimated that annual G&A expenses would be $182.9 million, nearly 16 times higher than FMC's estimate. UP's evidence, while at times lacking support, is much more detailed than FMC's. UP explained that the ORR would need G&A personnel distributed among seven different offices (the president's, marketing, finance, legal, human resources, supply, and safety offices), as well as costs for information technology (IT) systems, buildings, and vehicles that would be used by G&A personnel. In the absence of any basis for FMC's G&A expense estimate, we base our analysis on UP's evidence and adjust that evidence where FMC has demonstrated on rebuttal that UP's estimates are overstated.

1. President's Office

UP would staff the ORR president's office with seven positions. FMC objects to UP's inclusion of four community relations representatives, arguing that under its operating plan local officers would perform these functions. Because we have rejected FMC's operating plan and FMC has acknowledged that personnel for community relations would be necessary, we include these personnel under the president's office.

2. Marketing Department

UP contends that the ORR would need a highly effective marketing and sales organization, as the routes and traffic FMC has chosen to include in the SAC analysis are highly competitive. While acknowledging that much of the ORR's traffic would be overhead traffic,[234] UP points out that the ORR would originate a significant amount of traffic, including grain shipments, coal from the Powder River and Hanna basins,[235] and FMC's traffic.

On rebuttal, FMC agrees that the ORR would need a substantial marketing organization. However, for agricultural products, FMC contends that, by focusing on those shippers that constitute the major portion of the ORR's agricultural business, the marketing staff could be limited. But any business plan that assumes, as FMC's SAC analysis does, that it would retain all of its customers must plan to devote resources to all those customers. By assuming that the ORR could ignore a group of customers, FMC has failed to demonstrate the feasibility of its limited staff. For automobile, TOFC, chemical and general commodity traffic, FMC merely asserts that a smaller marketing staff than UP proposes would be sufficient.[236] But without some evidence beyond the mere assertions of FMC's witnesses, we cannot conclude that UP's evidence should be rejected. FMC also suggests that UP's proposed staff of 11 to assist the sales force is inappropriate because the ORR would have no interest in increasing service to local shippers.[237] However, in its traffic projections that we have accepted, FMC projects that local traffic would increase over the 20-year analysis period. It is unlikely that the ORR could realize this increase without a sales staff to contact shippers. Therefore, we accept UP's evidence.

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[234] While originating carriers would have the primary role in marketing to off-line shippers, UP contends that the ORR could not afford to ignore such shippers or connecting carriers or it could lose overhead traffic.

[235] FMC agrees with UP on the number of personnel that would be devoted to marketing coal transportation.

[236] FMC Reb. V.S. Stern at 97-98.

[237] FMC Reb. V.S. Stern at 100.

UP proposed that 16 employees would be needed to handle damage prevention and claims. FMC argues that a smaller staff could handle such duties because the ORR would not terminate a significant amount of traffic and because claims on coal traffic (a significant portion of the ORR's traffic) would be infrequent. Here, FMC has a point. Because claims are generally filed with the terminating carrier and because claims on coal traffic are infrequent, it is reasonable to assume that the ORR could do with a smaller staff than proposed by UP. On this issue, we accept FMC's evidence.

To estimate the marketing personnel that would be needed, we begin with the 104 employees proposed by UP, reduce that figure by eight because UP only describes duties for 96 employees, and further reduce the total by 14 to reflect the smaller damage prevention and claims staff. As a result, we find that the ORR would need a marketing staff of 82.

3. Finance Department

UP proposed a finance staff of 168 for the ORR. UP notes that the largest part of that total, an accounting staff of 130, would be less than 19% of UP's accounting staff, although the ORR would earn 24% of UP's 1997 annual revenue. UP also notes that, due to the volume and diversity of ORR traffic, a staff of 45 would be needed (even with a highly automated rating and billing system) to bill for over two million carloads of traffic. Other staff would be needed to handle tax matters, auditing and budgeting.

In its opening evidence, FMC did not explain what staff would be needed in the finance department. On rebuttal, rather than addressing UP's proposal, FMC proposed a different organizational structure for the finance department, to which it assigned employees based merely on the opinion of its witness. Because FMC has not provided any evidence that can be used to restate UP's evidence, we cannot adjust UP's estimates. Furthermore, we will not adopt FMC's alternative proposal provided on rebuttal because it is based merely on the opinion of its witness, an opinion to which UP had no opportunity to respond. Therefore, we accept UP's evidence.

4. Legal Department

UP proposed a legal department for the ORR with 73 employees, while FMC would limit such employment to 31 individuals.

a. General Counsel's Office

UP would staff the General Counsel's office with four attorneys and five support personnel. UP notes that railroads of similar size have more attorneys (the IC General Counsel's office has five attorneys; CNW had eight attorneys prior to merging with UP).

FMC argues that the General Counsel staff duplicates functions of other offices. We do not agree. While UP suggests that attorneys from the General Counsel's office would be involved in contract negotiating conducted by the marketing department and personnel matters, that does not imply a duplication of duties. Indeed, it is the norm for a General Counsel's office to advise various departments on legal issues. In the absence of any showing that UP's staffing requirements for the General Counsel's office are overstated, we accept UP's evidence.

b. Risk Management Office

The risk management office would handle duties associated with claims, policing, health services and administrative support.

I. Claims

UP notes that every Class I railroad needs an internal claims department to manage claims payouts and that UP itself currently has a claims department of 177 employees. UP notes that in 1998, it received 2,555 new claims of personal injury or property damage in the States where the ORR would replace UP. Finally, UP asserts that, based on KCS and IC experience, the ORR would face more than 300 claims annually. UP proposed a staff of 19 claims representatives. UP would also include four physicians and seven nurses to review injured employees' medical treatment and condition.

FMC asserts that one injury would occur for every 100,000 hours worked. Based on this assertion, FMC would provide for one claims representative. However, FMC has offered no support for its rate-of-injury estimate. Absent any support, we cannot accept its evidence. Furthermore, while FMC asserts that nurse and consulting physician services could be obtained by contracting, FMC provided no funds for obtaining these services. In the absence of an effective rebuttal of UP's evidence, we accept UP's evidence.

ii. Railroad Police

UP would include 21 special agents and 2 administrators. FMC would include 22 special agents and 2 administrators. Given the relative agreement of the parties of this issue, we accept UP's evidence as the least-cost evidence.

iii. Health Services[238]

According to UP, the health services staff would be responsible for ensuring UP's compliance with a host of federally mandated health exams for various categories of railroad employees and for coordinating drug-testing. FMC argues that health exams and random drug-testing would be done in the field by a variety of ORR operating personnel. However, FMC offers no evidence that field personnel would have the time or training to perform such duties or that the operating personnel of any other railroad perform such testing. In the absence of support for FMC's position, we accept UP's evidence.

iv. Administrative Support

UP would have the ORR provide a staff of three to perform budgeting, payroll, filing and data entry duties, and to support the claims operations database and the railroad police reporting system. UP currently has 13 employees performing these tasks. FMC indicates that, with so few people in the risk management department, these three employees would not be needed.

Because we have accepted UP's staffing estimates for the risk management section, we accept its estimate for administrative support. In summary, we accept UP's staffing requirement for the ORR's legal department.

[238] Both parties include health services personnel in the legal department.

5. Human Resources Department

UP asserts that the ORR would need 49 employees to perform training, personnel management, and compensation/benefits duties, while FMC would limit that staff to five employees. UP currently has more than 175 employees on its human resources staff and its evidence details the work that would need to be performed by the ORR's human resources department.

While claiming that UP has overstated the requirements for the human resources department, FMC has not shown that those positions UP discusses would be unnecessary or that its alternative plan for staffing the department is reasonable. For example, FMC suggests that the ORR would have a contractor administer the employee 401(k) retirement program. But FMC did not include any contract expense for administering that program. Therefore, in general, we find that UP's evidence is the better of record.

However, we adjust UP's estimate to exclude those positions for which UP has provided no justification. While UP argues that a staff of 49 employees would be needed, it only discussed the need for 20 employees. As with FMC's opening evidence, we will not accept personnel requirements without some discussion of the duties that the proposed employees would be expected to perform. Of the 20 positions that UP discussed, two are allocated to instruct employees in the areas of MOW, telecommunications, car inspection, and locomotive repair. As we have discussed, MOW and car and locomotive maintenance will be performed under contract. Thus, we find no justification for those two positions. Likewise, we exclude two positions that UP would include to monitor employee unionization efforts. We have no basis on which to assume that employees would attempt to unionize when they would already be receiving union pay and benefits.[239] Thus, we find justification for only 16 human resource employees.

6. Supply Department

UP included a supply department that would be responsible for leasing, purchasing, storing and transporting all equipment and materials to operate the ORR. FMC did not provide for such a department, arguing that the services would either be provided by contractors or by staff in other departments. Because FMC has not provided any basis for its assumption that contractors or other staff would perform supply functions, we review the parties' arguments relative to the specific functions that UP suggests would be performed by a supply department.

a. Leasing

UP would have a staff of five handle the leasing of locomotives and freight cars that the ORR would require. FMC argues that UP has assigned the same duties to more than one person. However, we cannot determine from the evidence (and FMC does not indicate) where UP has duplicated this function. Therefore, we accept UP's evidence.

b. Materials Purchasing

UP included four employees to coordinate the purchasing of materials to build and maintain the ORR. FMC argues that a staff of only two would be needed to purchase materials and

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[239] Both parties assume that ORR employees would receive the same pay as UP employees. *See,* "Wages and Salaries," *infra.*

equipment. Because all costs for construction of the ORR have been provided for in the initial investment costs, and all costs for maintaining the ORR have been provided for in MOW costs, we fail to see why additional staff should be accounted for under G&A expense. Therefore, we will not require the inclusion of costs for the additional two staff positions.

c. Fuel

UP, noting that fuel would be a major operating expense, provided a staff of two to monitor fuel purchases. FMC argues that UP provided for such staff within its locomotive department. We agree. In our discussion of the "Locomotive Management Department," we accepted UP's staffing proposal, which included a manager of fuel resources. Therefore, we see no need to include duplicate staff within the supply department.

d. Miscellaneous Materials

UP proposed a staff of seven to oversee purchasing of materials ranging from contract services, to replacement parts for machinery, to office supplies. We believe it is reasonable to assume (and FMC has not argued to the contrary) that a railroad the size of the ORR would require some staff to handle miscellaneous contracts and purchases. Therefore, we accept UP's evidence on this issue.

e. Storage/Warehouses

UP proposed a staff of 76 to operate five warehouses to support the locomotive and car repair shops. FMC points out that the ORR would contract for repairs and therefore would not need warehouses to stock repair material. Indeed, FMC contends that railroads no longer even keep central warehouses of material, but that vendors routinely keep the material in their inventory and send it directly to field sites as required.

UP has not supported the need to provide staff for this function. The parties have agreed that locomotive and car repairs would be carried out by a contractor and the necessary cost has been included. In addition, we find no evidence in the record that UP has provided for any inventory of materials associated with locomotive and car repair. Therefore, we have excluded these 76 positions from our restatement.

f. Administrative Staff

UP would have an administrative staff of 15 manage the supply department. FMC argues that the supply department would not be large enough to warrant such a large administrative staff. We agree. We have found that the supply department would only need a staff of 12; therefore, an administrative staff of 15 cannot be justified.

7. Safety Department

Based on its existing operations, UP provided for a staff of 36 employees assigned to three offices (Central Safety, Derailment Prevention, and Environmental Management) to train employees to work safely, provide grade-crossing safety programs, develop safety rules, comply with Federal regulations, maintain statistics, and prepare reports required by various government agencies. FMC contends that the ORR simply would not have the same complexity or exposure to hazardous chemicals as does UP and, therefore, that the ORR would not need a large safety department. FMC points out that, unlike UP, the ORR would not serve the chemical belt in Louisiana and Texas and that it would serve fewer than 10 chemical plants.

FMC's opening evidence provided no basis for concluding that its proposed assignment of two employees to safety functions would be feasible. On rebuttal, FMC assigned no personnel to a central safety department. FMC further asserts that derailment prevention is important, but that the ORR would have local personnel investigate derailments. However, FMC never indicates what local personnel would be available for such duty or that any other railroad uses such a procedure. Finally, FMC simply asserts that, with fewer hazardous operations than UP, the ORR would need fewer personnel than estimated by UP for environmental management.[240]

While we agree that the ORR would have less complex operations than UP and would serve fewer hazardous materials shippers, FMC has provided no basis for us to restate UP's evidence. Therefore, we have no alternative but to use UP's evidence.

8. Information Technology

Without any support, FMC's opening evidence included $3.1 million annually for the ORR's IT requirements.[241] UP argues that FMC greatly underestimated the cost of IT. UP estimated that the ORR would incur 26% ($57.1 million annually)[242] of the IT costs that UP incurs.[243]

On rebuttal, FMC argued that UP's evidence does not reflect the ORR's G&A requirements. It then developed a completely new estimate for annual IT costs of $5.6 million ($4.2 million in computer hardware and software costs and $1.4 million in salaries).

While FMC offered no support for its opening evidence, UP did only a marginally better job of supporting its evidence. Given the poor quality of the evidence, we can only decide this issue on burden-of-proof grounds. Because FMC provided no support for its initial estimates, it has not met even a minimum evidentiary standard for demonstrating that its proposal would be feasible. Furthermore, on rebuttal FMC did not present evidence that would permit a restatement of UP's evidence. Finally, the new evidence that FMC offered on rebuttal cannot be accepted because UP has had no opportunity to respond. Therefore, because we find that FMC has not met its burden of proof on this issue, we accept UP's evidence.

9. Communication Equipment

UP included a labor cost for 157 employees associated with support and maintenance of the ORR's communications system. FMC did not provide for a staff for this purpose or challenge UP's staffing level for maintaining and servicing communication equipment. Thus, UP's staffing estimate is the only evidence of record. In the absence of any evidence showing that a staff would not be required to service the communication equipment, we accept UP's staffing requirements.

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[240] In support of this argument FMC states that the ORR would only have one fueling station. FMC Reb. V.S. Stern at 87. But in designing the ORR, FMC provided for 6 locomotive servicing facilities. FMC Reb. Workpapers "maintenance building costs.xls."

[241] FMC Open. V.S. Burris at 39 and Workpaper WP 0352 listing IT components costing $21,957,558 (or $3.1 million on an amortized annual basis over 10 years).

[242] This annual expense results partially from the amortization of an initial investment of $140 million in computer hardware and software.

[243] UP states that the ORR's gross ton-miles would be 26% of UP's.

10. Motor Vehicles, Travel and Equipment & Supplies

The parties' estimates for motor vehicles, travel, and equipment and supplies that would be needed by the G&A staff are based on their respective G&A staffing levels. We restate these costs to reflect the staffing levels we have accepted.

11. Office Buildings, Furnishings and Maintenance Costs

UP and FMC included costs for leasing, furnishing and maintaining commercial office space. We reject FMC's method of developing costs for leasing for the same reasons we rejected them in our discussion of "Operating Materials and Supplies," *supra*. In addition, we cannot determine, and UP has not explained, how it developed its lease costs. UP's cost figures simply appear as a number in a spreadsheet. In the absence of any useable evidence on lease costs, we have developed building costs based the methodology used by the parties to develop building cost for operating personnel, and include these costs as investments. *See,* Appendix C.

The parties used the ARZ Office Supplies Catalog to develop the cost for furnishings. We use the parties' procedures to develop furnishing costs, adjusted to reflect our restated G&A staffing levels. Finally, FMC developed maintenance costs for buildings housing G&A personnel on a square-foot basis, as it did for buildings that would be used by operating personnel. In contrast, UP provided no support for its building maintenance costs. Therefore, we accept FMC's evidence.

L. Wages and Salaries

With the exception of train crew personnel, FMC's estimate of annual salaries is based on data contained in UP's 1996 Wage Forms A and B. Salaries were increased by 40% to cover the cost of fringe benefits and then indexed to 1997 levels. Train crew wages were calculated by developing a basic day's pay for each position from a union contract. The daily pay rates were then applied to the number of days worked by each train crew member.

UP based its estimate of compensation for all employees on UP's 1996 Wage Forms A and B. UP increased wages by 43.5% for fringe benefits, arguing that between 1996 and 1997 fringe benefit costs increased more rapidly than wages.

UP takes exception to FMC's approach of estimating train crew wages, insisting that it fails to take account of allowances such as pay for meals, partial holidays, holidays, absences on leave, vacations, overtime, attending court, attending safety meetings, etc. and fringe benefit costs such as health insurance, railroad retirement tax payments, etc. UP claims that under FMC's approach, realistic increases in crew compensation for fringe benefits would be 76% for road crews and 89.3% for yard crews. UP insists that, even though it is assumed that the ORR would be a non-union carrier, it is unreasonable to assume that individuals would be willing to work for substantially less than their union counterparts on UP or the nearby BNSF.

FMC argues that UP's use of 43.5% as the benefit rate is excessive. It notes that under our URCS costing system UP's 1997 fringe benefit increase was only 29.5% for train crews and 31.1% for switch crews.

We note that, except for train crew wages, the only difference between UP and FMC hinges on the increase to account for fringe benefits. We agree with FMC that a 40% adjustment for fringe benefits is reasonable in light of the increase shown in UP's 1997 URCS calculations.[244] For train crews, we agree with UP that FMC's partial use of the union contract wage rate understates the full labor costs for train and engine crew members, in that it ignores the other costs pointed out by UP.

M. Loss and Damage Expense

The parties agree that the ORR would incur annual loss and damage expenses of $2,774,158.

N. Insurance Expense

The parties agree that insurance expenses for the ORR can be estimated by multiplying the ratio of UP's 1996 system-average ratio of "other casualties and insurance" expenses to UP's 1996 total freight expenses (0.0487) times the ORR's annual freight expenses. Our restatement reflects the application of this ratio to the freight expenses that we have determined would be incurred by the ORR.

O. Ad Valorem Tax

Ad valorem taxes are developed based on the tax rate of each State and the number of ORR route miles in each State. The parties agree on the tax rates. FMC estimates that the ORR would pay $18,070,211 in ad valorem taxes, while UP estimates that such taxes would amount to $17,450,675. We restate ad valorem taxes based on the tax rate assessed by each State and on the route miles we accepted in Appendix B.

P. Maintenance-of-Way Expense

Generally, maintenance-of-way (MOW) expenses are incurred for operating maintenance (preventative maintenance to keep the rail plant in operating condition) and for program maintenance (the systematic replacement of worn-out assets at the end of their useful lives). In their investment evidence, the parties included funds to replace all of the ORR's assets, thereby obviating the need to include funds under MOW to replace worn-out assets.

As Table D-5 indicates, FMC estimated that the ORR would incur annual MOW expenses of $73 million. However, there is a lack of evidence supporting this estimate.[245] In many instances, FMC merely asserted that its estimates would be appropriate for the ORR.[246] But bare assertions are not enough to satisfy FMC's burden of proof. In the absence of any creditable evidentiary

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[244] We also note that the implied benefit ratio imbedded in the AAR index used by both parties was 34.45%.

[245] FMC provided no funds to repair or replace damaged rail, ties and switches or to clean ditches. However, it is unreasonable to assume that these assets would never need maintenance over the course of their useful lives.

[246] For example, FMC staffed the MOW crews with a foreman and three other men. However, FMC made no attempt to support its assumption by reviewing the size of maintenance crews used by existing railroads. Regarding rail grinding, FMC assumed that this work would be performed on an annual basis. However, FMC never explained why this is a reasonable assumption.

submission from FMC, we accept for the most part the evidence submitted by UP.[247] However, as explained below we have adjusted UP's estimates of maintenance personnel, ROW roads and firebreaks, and road crossing materials.

Table D-5

Maintenance of Way Costs ($000)			
	UP	FMC	STB
1. Maintenance Personnel	$55,609	$13,416	$41,707
2. Maint. Roads & Firebreaks	1,660	0	624
3. Road Crossing Material	458	0	0
4. Ultrasonic Rail Testing	4,908	2,854	4,908
5. Rail Grinding	32,249	22,515	32,249
6. Misc. Outside Contracts	5,000	7,500	5,000
7. Buildings & Facilities	0	500	0
8. Contract Labor	0	10,040	0
9. Track Geometry Testing	1,415	10,029	1,415
10. Vegetation Control	1,225	1,245	1,250*
11. Derailment	4,000	4,000	4,000
12. Snow Removal	1,000	1,000	1,000
13. Rail Defect Change-out	10,420	0	10,159**
14. Spot Cross Tie	6,289	0	6,289
15. Spot Switch Tie	243	0	243
16. Spot Surfacing	5,315	0	5,315
17. Ditching	6,434	0	6,434
18. Sign & Fence Maint.	1,341	0	1,338*
Totals	**$137,566**	**$73,099**	**$121,931**

* Restatement based on route miles accepted in Appendix B.
** Reflects cost of rail accepted in Appendix C.

1. Maintenance Personnel

UP included $55.6 million for personnel that would perform both operating and program maintenance. However, as discussed above, costs for program maintenance are included in the investment costs for the ORR. Thus, UP's $55.6 million estimate is overstated. The only evidence on the record as to what portion of the maintenance staff's time would be devoted to performing

[247] The parties agree on the costs for vegetation control, derailment response and snow removal.

operating maintenance was supplied by FMC, which estimated that 75% of the staff's time would be devoted to operating maintenance.[248] Consequently, we use this estimate to adjust UP's evidence.

2. Maintenance Roads and Firebreaks

UP included approximately $1.6 million for annual upkeep of maintenance roads and firebreaks. However, in Appendix C we concluded that the ORR would not need a maintenance road. Therefore, we remove maintenance road upkeep costs from UP's estimate.

3. Road Crossing Material

UP included approximately $0.5 million in annual operating costs to maintain all public and private road crossings. In Appendix C, we explained that generally the ORR would not incur costs associated with grade crossings. Therefore, we find that the ORR would not incur costs to maintain these crossings.

Q. Soda Dome

UP leases space in the Soda Dome in Portland, OR to unload and store shipments of soda ash. FMC has adopted this operational procedure for the ORR. The parties agree that the annual expense for the use of the Soda Dome would be $240,000.

APPENDIX E — DISCOUNTED CASH FLOW COMPUTATION

The stand-alone cost test compares the estimated revenues that the ORR would earn over the 20-year analysis period to the estimated costs of constructing and operating the hypothetical rail system. As in prior cases, a discounted cash flow analysis is used to discount the 20-year stream of estimated revenues and costs to a common point in time. In this appendix, we discuss various issues affecting the DCF calculation not discussed above, as well as the results of that calculation.

A. Cost of Capital

As in prior SAC cases, we find that it is appropriate to assume that the rate of return that the ORR would need to earn is the railroad industry cost of capital. Accordingly, we use our annual cost of capital findings for 1995 through 1998 as the cost of capital that would be experienced by the ORR.[249] FMC and UP have each argued for an adjustment to those figures here. As discussed below, we decline to make the adjustments proposed by either side.

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[248] *See,* FMC Reb. Pattison Electronic Workpaper (FMC-MOW.wk4).

[249] The 1998 railroad-industry cost of capital was determined after the close of the record. Nevertheless, to reflect the most current data available, we include the 1998 figure in our SAC analysis here.

1. Adjustment Proposed by FMC

FMC does not argue that the ORR would face a different cost of capital than other Class I railroads; rather it argues that our method of determining the cost of capital for all railroads should be modified.[250] This proceeding is not the place to present such an argument. We conduct a rulemaking proceeding annually to measure the railroad industry's cost of capital and, if FMC believes the longstanding process that we use should be changed, that argument should be raised in the annual rulemaking proceeding.

2. Adjustment Proposed by UP

UP claims that the ORR would experience a higher cost of capital than the railroads upon whom we base our annual cost of capital finding. More specifically, applying "real options" theory,[251] UP argues that the ORR would face additional uncertainties not faced by existing Class I railroads.[252] To reflect this greater risk, UP argues that the capital carrying charges for the ORR should be increased by 9% each year, which would be the functional equivalent of increasing the cost of capital figure that measures the degree of risk faced by railroads.[253] We find such an adjustment unrealistic. More importantly, it would be inappropriate and unfair to allow UP to charge captive shippers a higher rate than would otherwise be justified based on a risk that its investors do not face.

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[250] Specifically, FMC argues that the spread between equity and debt that existed in the 1980s (4.02%) should be applied to the railroads' current cost of debt to determine the cost of equity and the resulting cost of capital. FMC argues that the spread between the cost of railroad equity and debt used in our annual cost-of-capital determination has increased and that this increase incorrectly indicates that rail equity is riskier in the 1990s than it was in the 1980s. UP responds that the risk characteristics of debt and equity are different; that the cost of equity is best determined by looking to financial markets, rather than looking at historic spreads; and that FMC's method, based on the spread between debt and equity, is not used by financial analysts.

UP's criticisms are valid. FMC has not demonstrated a correlation between the yields on stocks and debt instruments. Moreover, using the spread between debt and equity in the 1980s to determine the cost of equity in the 1990s is problematic when there are much better, more direct procedures available for estimating the cost of railroad equities.

[251] Real options theory is a relatively new economic theory that applies to real (tangible) assets the Black-Scholes approach to valuing options on financial assets.

[252] In particular, UP hypothesizes that the ORR would face an "asymmetric risk" arising from the notion that its upside earnings potential — should the uncertain future work out better than is expected — would be truncated by the threat of entry by additional stand-alone carriers poised to enter under those circumstances, while the ORR would face the full (*i.e.*, non-truncated) adverse effects of a future that works out worse than expected.

[253] To the extent that the investors of existing railroads face any asymmetric risk arising from our application of contestable market theory (through the SAC constraint) to rates charged on captive traffic, that risk is already reflected in the railroad industry cost of capital that we measure annually.

B. Inflation Indexes

In prior cases, we have relied on historical rates of railroad inflation to project future inflation. In this proceeding, FMC used inflation forecasts from Data Resources, Inc. to estimate inflation in rail assets. While UP suggests that the 5-year historical average is more appropriate, its calculations nonetheless used the same inflation indexes as FMC. We use the inflation projections applied by the parties in their DCF models.[254]

C. Initial Investment

The parties agree that the investment needed to construct the ORR would be spread over a 3-year period. While they disagree on when during that 3-year period certain investment would be made, neither FMC nor UP explained the basis for its proposed timing. Because FMC failed to meet its burden of supporting its approach, we use UP's schedule for the timing of investment.

D. Interest During Construction

FMC and UP agree on the method for calculating interest during construction. Our restatement reflects the level of investment required (*See,* Appendix C) and UP's evidence on when various investments would be made.

E. Debt

The parties agree on the ORR's debt rate, the amount of investment that would be financed through debt, and the amortization period of the debt. We use the agreed upon procedures of the parties.

F. Tax Depreciation

The parties agree on the procedure for determining tax depreciation, and our restatement reflects this agreement.

G. Replacement of Assets

Rather than providing for program maintenance,[255] UP and FMC provided for replacement of all of the ORR's assets except land (which would never need to be replaced). UP used its 1997 asset lives and salvage values to calculate replacement costs. FMC claims that use of UP's 1997 data deviates from prior precedent that determined asset lives and salvage values based on the ICC's Report No. 5, *File of Estimates of Life and Salvage and Related Depreciation Calculations* (1985).

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[254] We note that, while the parties agreed to use a composite inflation index for land, UP's DCF divided the composite into separate indexes for rural and urban land. Because we use UP's DCF spreadsheets, the different inflation for each land type is reflected. This procedure, however, has only a minor impact on the calculation of the ORR's capital carrying charges.

[255] Program maintenance is the planned replacement of assets at the end of their useful lives.

The Report No. 5 data are 15 years old and reflect UP traffic densities from that time period. The traffic densities contemplated for the ORR more closely approximate UP's current densities. Therefore, we conclude that UP's 1997 data are the better evidence of record because those data better approximate the densities projected for the ORR and the impact those densities would have on the lives of the ORR's assets.

H. Taxes

The parties agree on the method used to calculate Federal and State tax liabilities. Our restatement follows the procedure used by the parties.

I. Results of DCF Analysis

Table E-1 displays the results of our DCF analysis. It demonstrates that the ORR would generate greater revenues in each year of the 20-year analysis period than would be needed to cover all the capital costs and operating costs that would be incurred in or assigned to that year.

Table E-1
ORR CASH FLOW
(millions of current dollars)

Year	Capital Costs & Taxes	Operating Expenses	Total Annual Expenses	ORR Revenues	Over-payment	Rate Reduction
1997	$514,0	$647,5	$1,161,5	$1,180,1	$18,6	1,60%
1998	1,034,4	1,296,2	2,330,6	2,488,7	158,1	6,78%
1999	1,049,4	1,398,3	2,447,7	2,680,6	232,9	9,52%
2000	1,068,5	1,524,2	2,592,7	2,908,1	315,5	12,17%
2001	1,089,9	1,613,1	2,702,9	3,096,9	394,0	14,58%
2002	1,117,1	1,692,1	2,809,2	3,255,3	446,0	15,88%
2003	1,147,7	1,781,2	2,928,8	3,418,4	489,6	16,72%
2004	1,178,7	2,375,7	3,554,5	3,570,8	16,4	0,46%
2005	1,210,3	2,012,5	3,222,8	3,724,3	501,4	15,56%
2006	1,242,9	2,106,7	3,349,6	3,897,4	547,8	16,36%
2007	1,276,6	2,251,2	3,527,9	4,087,2	559,3	15,85%
2008	1,312,0	2,293,0	3,605,1	4,268,6	663,5	18,40%
2009	1,348,8	2,377,2	3,726,0	4,428,0	701,9	18,84%
2010	1,386,7	2,491,4	3,878,1	4,639,1	761,0	19,62%
2011	1,425,8	3,347,3	4,773,0	4,883,7	110,7	2,32%
2012	1,466,0	2,847,9	4,313,9	5,132,0	818,1	18,96%

Year	Capital Costs & Taxes	Operating Expenses	Total Annual Expenses	ORR Revenues	Over-payment	Rate Reduction
2013	1,507,5	2,984,5	4,492,0	5,391,4	899,4	20,02%
2014	1,550,3	3,142,0	4,692,3	5,657,5	965,2	20,57%
2015	1,594,4	3,212,1	4,806,5	5,948,9	1,142,4	23,77%
2016	1,639,9	3,378,9	5,018,8	6,261,5	1,242,7	24,76%
2017	837,4	1,753,5	2,590,9	3,255,1	664,2	25,64%

APPENDIX F — MAXIMUM REASONABLE RATES

Table E-1 in Appendix E contains the percentage rate reductions which need to be applied to the challenged rates to determine maximum reasonable rate levels.[256] In Tables F-1 through F-15 below, we apply these rate reductions to each of the 15 challenged rates over which we have found UP to have market dominance. However, because our maximum rate jurisdiction is limited to rates generating revenues of at least 180% of the carrier's variable cost of providing the service, we cannot prescribe a rate below the 180% R/VC level. Thus, the maximum reasonable rate is the higher of the rate floor or SAC rate shown.[257]

FMC's traffic at issue moves in both railroad-owned and private cars. As shown in Appendix A, the type of car used has a significant impact on the level of UP's variable cost, with movements using private cars having higher a total variable cost. Thus, Tables F-1 through F-15 show different rate floors, and thus potentially different maximum reasonable rates, depending on the ownership of the car. (Where one type of car is used solely to move the traffic, no rate floor or maximum reasonable rate is shown for the other type of car.)

Tables F-1 through F-15 are divided into two parts. The upper part shows the maximum reasonable rates for the time periods for which we have data in the record. The lower portion of each table (below the shaded line) addresses later time periods. For those later time periods, the SAC analyses presented by the parties have assumed a certain amount of rate growth, and the percentage rate reductions calculated in Appendix E (shown in Table E-1) reflect that rate growth. Thus, Tables F-1 through F-15 show the inflated rates (adjusted for the forecast growth) and it is these inflated rates to which our rate reductions must be applied to determine the SAC rate. We are not able to compute the rate floor for these later periods, as we do not know what the variable costs will be for those periods. However, the parties should calculate this rate floor, consistent with the procedures and findings contained in Appendix A. If the rate floor is higher than the SAC rate shown in the tables, then the maximum reasonable rate will be the rate floor as so calculated.

We note that the rates in the years 2004 and 2011 do not reflect the general rate trend shown for other years. The reason for this apparent anomaly is that the parties have included in their SAC

[256] On January 1, 1999, UP increased most of the rates at issue in this proceeding. The tables reflect the rate increases.

[257] In any period in which a rate was unused in 1997 or 1998, we do not show a rate floor or a maximum reasonable rate for that period.

analyses substantial expenses in those years for the overhaul of locomotives. The parties did not spread these expenses over time, but rather treated them as expenses incurred in a single year every seven years. The effect is to substantially increase the ORR's total expenses in the two years in which these periodic expenses are taken, resulting in significantly higher revenue requirements for those years. Although ordinarily we would not expect railroads to set rates in this manner, we have not attempted to adjust for these large periodic expenses given the parties' agreement to treat these expenses in this manner.

Table F-1
Move A - Soda Ash from Westvaco, WY to Clearing, IL

Period	Existing Rate	Rate Inflator	Inflated Rate	Rate Reduction	SAC Rate	Rate Floor (180% R/VC) RR Car	Rate Floor (180% R/VC) Pvt Car	Maximum Reasonable Rate RR Car	Maximum Reasonable Rate Pvt Car
3rd Q 97	$47.46			1.60%	$46.70				
4th Q 97	$47.46			1.60%	$46.70		$39.11		$46.70
1st Q 98	$47.46			6.78%	$44.24				
2nd Q 98	$47.46			6.78%	$44.24				
3rd Q 98	$47.46			6.78%	$44.24				
4th Q 98	$47.46			6.78%	$44.24				
1999	$47.93			9.52%	$43.37				
2000		0.74%	$48.28	12.17%	$42.41	Maximum reasonable rate is the higher of the SAC rate or the rate floor. Rate floor to be determined by the parties once variable costs for each year are known.			
2001		0.89%	$48.71	14.58%	$41.61				
2002		0.93%	$49.17	15.88%	$41.36				
2003		0.82%	$49.57	16.72%	$41.28				
2004		0.82%	$49.98	0.46%	$49.75				
2005		0.82%	$50.39	15.56%	$42.55				
2006		0.82%	$50.80	16.36%	$42.49				
2007		0.82%	$51.22	15.85%	$43.10				
2008		0.82%	$51.64	18.40%	$42.14				
2009		0.82%	$52.06	18.84%	$42.25				
2010		0.82%	$52.49	19.62%	$42.19				
2011		0.82%	$52.92	2.32%	$51.69				
2012		0.82%	$53.35	18.96%	$43.24				
2013		0.82%	$53.79	20.02%	$43.02				
2014		0.82%	$54.23	20.57%	$43.07				
2015		0.82%	$54.67	23.77%	$41.68				
2016		0.82%	$55.12	24.76%	$41.47				
2017		0.82%	$55.57	25.64%	$41.33				

Table F-2
Move B - Soda Ash from Westvaco, WY to Chicago, IL

Period	Existing Rate	Rate Inflator	Inflated Rate	Rate Reduction	SAC Rate	Rate Floor (180% R/VC) RR Car	Rate Floor (180% R/VC) Pvt Car	Maximum Reasonable Rate RR Car	Maximum Reasonable Rate Pvt Car
3rd Q 97	$47.46			1.60%	$46.70	$31.36	$40.37	$46.70	$46.70
4th Q 97	$47.46			1.60%	$46.70				
1st Q 98	$47.46			6.78%	$44.24				
2nd Q 98	$47.46			6.78%	$44.24				
3rd Q 98	$47.46			6.78%	$44.24				
4th Q 98	$47.46			6.78%	$44.24				
1999	$47.93			9.52%	$43.37				
2000		0.74%	$48.28	12.17%	$42.41	Maximum reasonable rate is the higher of the SAC rate or the rate floor.			
2001		0.89%	$48.71	14.58%	$41.61				
2002		0.93%	$49.17	15.88%	$41.36	Rate floor to be determined by the parties once variable costs for each year are known.			
2003		0.82%	$49.57	16.72%	$41.28				
2004		0.82%	$49.98	0.46%	$49.75				
2005		0.82%	$50.39	15.56%	$42.55				
2006		0.82%	$50.80	16.36%	$42.49				
2007		0.82%	$51.22	15.85%	$43.10				
2008		0.82%	$51.64	18.40%	$42.14				
2009		0.82%	$52.06	18.84%	$42.25				
2010		0.82%	$52.49	19.62%	$42.19				
2011		0.82%	$52.92	2.32%	$51.69				
2012		0.82%	$53.35	18.96%	$43.24				
2013		0.82%	$53.79	20.02%	$43.02				
2014		0.82%	$54.23	20.57%	$43.07				
2015		0.82%	$54.67	23.77%	$41.68				
2016		0.82%	$55.12	24.76%	$41.47				
2017		0.82%	$55.57	25.64%	$41.33				

Table F-3
Move C - Soda Ash from Westvaco, WY to Irondale, IL

Period	Existing Rate	Rate Inflator	Inflated Rate	Rate Reduction	SAC Rate	Rate Floor (180% R/VC) RR Car	Rate Floor (180% R/VC) Pvt Car	Maximum Reasonable Rate RR Car	Maximum Reasonable Rate Pvt Car
3rd Q 97	$47.46			1.60%	$46.70		$42.46		$46.70
4th Q 97	$47.46			1.60%	$46.70		$42.48		$46.70
1st Q 98	$47.46			6.78%	$44.24	$33.93	$44.60	$44.24	$44.60
2nd Q 98	$47.46			6.78%	$44.24		$45.04		$45.04
3rd Q 98	$47.46			6.78%	$44.24		$44.42		$44.42
4th Q 98	$47.46			6.78%	$44.24		$43.79		$44.24
1999	$47.93			9.52%	$43.37				
2000		0.74%	$48.28	12.17%	$42.41				
2001		0.89%	$48.71	14.58%	$41.61				
2002		0.93%	$49.17	15.88%	$41.36				
2003		0.82%	$49.57	16.72%	$41.28				
2004		0.82%	$49.98	0.46%	$49.75				
2005		0.82%	$50.39	15.56%	$42.55				
2006		0.82%	$50.80	16.36%	$42.49				
2007		0.82%	$51.22	15.85%	$43.10				
2008		0.82%	$51.64	18.40%	$42.14				
2009		0.82%	$52.06	18.84%	$42.25				
2010		0.82%	$52.49	19.62%	$42.19				
2011		0.82%	$52.92	2.32%	$51.69				
2012		0.82%	$53.35	18.96%	$43.24				
2013		0.82%	$53.79	20.02%	$43.02				
2014		0.82%	$54.23	20.57%	$43.07				
2015		0.82%	$54.67	23.77%	$41.68				
2016		0.82%	$55.12	24.76%	$41.47				
2017		0.82%	$55.57	25.64%	$41.33				

Maximum reasonable rate is the higher of the SAC rate or the rate floor.

Rate floor to be determined by the parties once variable costs for each year are known.

Table F-4
Move E - Soda Ash from Westvaco, WY to Chicago, IL (interchange)

Period	Existing Rate	Rate Inflator	Inflated Rate	Rate Reduction	SAC Rate	Rate Floor (180% R/VC)		Maximum Reasonable Rate	
						RR Car	Pvt Car	RR Car	Pvt Car
3rd Q 97	$37.82			1.60%	$37.21				
4th Q 97	$37.82			1.60%	$37.21				
1st Q 98	$37.82			6.78%	$35.26	$27.41	$37.67	$35.26	$37.67
2nd Q 98	$37.82			6.78%	$35.26	$27.50	$37.82	$35.26	$37.82
3rd Q 98	$37.82			6.78%	$35.26	$26.69	$37.82	$35.26	$37.82
4th Q 98	$37.82			6.78%	$35.26	$26.69	$38.02	$35.26	$38.02
1999	$38.20			9.52%	$34.56				
2000		0.74%	$38.48	12.17%	$33.80				
2001		0.89%	$38.83	14.58%	$33.16				
2002		0.93%	$39.19	15.88%	$32.96				
2003		0.82%	$39.51	16.72%	$32.90				
2004		0.82%	$39.83	0.46%	$39.65				
2005		0.82%	$40.16	15.56%	$33.91				
2006		0.82%	$40.49	16.36%	$33.86				
2007		0.82%	$40.82	15.85%	$34.35				
2008		0.82%	$41.15	18.40%	$33.58				
2009		0.82%	$41.49	18.84%	$33.67				
2010		0.82%	$41.83	19.62%	$33.62				
2011		0.82%	$42.17	2.32%	$41.20				
2012		0.82%	$42.52	18.96%	$34.46				
2013		0.82%	$42.87	20.02%	$34.29				
2014		0.82%	$43.22	20.57%	$34.33				
2015		0.82%	$43.58	23.77%	$33.22				
2016		0.82%	$43.93	24.76%	$33.05				
2017		0.82%	$44.29	25.64%	$32.94				

Maximum reasonable rate is the higher of the SAC rate or the rate floor.

Rate floor to be determined by the parties once variable costs for each year are known.

Table F-5
Move G - Soda Ash Westvaco, WY to Galt, IL

Period	Existing Rate	Rate Inflator	Inflated Rate	Rate Reduction	SAC Rate	Rate Floor (180% R/VC) RR Car	Rate Floor (180% R/VC) Pvt Car	Maximum Reasonable Rate RR Car	Maximum Reasonable Rate Pvt Car
3rd Q 97	$42.79			1.60%	$42.11		$36.63		$42.11
4th Q 97	$42.79			1.60%	$42.11		$36.61		$42.11
1st Q 98	$42.79			6.78%	$39.89		$37.75		$39.89
2nd Q 98	$42.79			6.78%	$39.89		$36.70		$39.89
3rd Q 98	$42.79			6.78%	$39.89				
4th Q 98	$42.79			6.78%	$39.89				
1999	$43.22			9.52%	$39.11	Maximum reasonable rate is the higher of the SAC rate or the rate floor. Rate floor to be determined by the parties once variable costs for each year are known.			
2000		0.74%	$43.54	12.17%	$38.24				
2001		0.89%	$43.93	14.58%	$37.52				
2002		0.93%	$44.34	15.88%	$37.30				
2003		0.82%	$44.70	16.72%	$37.23				
2004		0.82%	$45.07	0.46%	$44.86				
2005		0.82%	$45.44	15.56%	$38.37				
2006		0.82%	$45.81	16.36%	$38.31				
2007		0.82%	$46.18	15.85%	$38.86				
2008		0.82%	$46.56	18.40%	$37.99				
2009		0.82%	$46.94	18.84%	$38.10				
2010		0.82%	$47.33	19.62%	$38.04				
2011		0.82%	$47.72	2.32%	$46.61				
2012		0.82%	$48.11	18.96%	$38.99				
2013		0.82%	$48.50	20.02%	$38.79				
2014		0.82%	$48.90	20.57%	$38.84				
2015		0.82%	$49.30	23.77%	$37.58				
2016		0.82%	$49.71	24.76%	$37.40				
2017		0.82%	$50.11	25.64%	$37.26				

Table F-6
Move H - Soda Ash from Westvaco, WY to Lawrence, KS

Period	Existing Rate	Rate Inflator	Inflated Rate	Rate Reduction	SAC Rate	Rate Floor (180% R/VC) RR Car	Rate Floor (180% R/VC) Pvt Car	Maximum Reasonable Rate RR Car	Maximum Reasonable Rate Pvt Car
3rd Q 97	$41.20			1.60%	$40.54		$30.33		$40.54
4th Q 97	$41.20			1.60%	$40.54		$30.37		$40.54
1st Q 98	$41.20			6.78%	$38.41	$26.48	$31.10	$38.41	$38.41
2nd Q 98	$41.20			6.78%	$38.41	$26.14	$30.74	$38.41	$38.41
3rd Q 98	$41.20			6.78%	$38.41		$30.96		$38.41
4th Q 98	$41.20			6.78%	$38.41		$30.65		$38.41
1999	$41.61			9.52%	$37.65				
2000		0.74%	$41.92	12.17%	$36.82				
2001		0.89%	$42.29	14.58%	$36.13				
2002		0.93%	$42.68	15.88%	$35.91				
2003		0.82%	$43.03	16.72%	$35.84				
2004		0.82%	$43.39	0.46%	$43.19				
2005		0.82%	$43.74	15.56%	$36.94				
2006		0.82%	$44.10	16.36%	$36.89				
2007		0.82%	$44.46	15.85%	$37.42				
2008		0.82%	$44.83	18.40%	$36.58				
2009		0.82%	$45.20	18.84%	$36.68				
2010		0.82%	$45.57	19.62%	$36.63				
2011		0.82%	$45.94	2.32%	$44.87				
2012		0.82%	$46.32	18.96%	$37.53				
2013		0.82%	$46.70	20.02%	$37.35				
2014		0.82%	$47.08	20.57%	$37.39				
2015		0.82%	$47.47	23.77%	$36.18				
2016		0.82%	$47.85	24.76%	$36.01				
2017		0.82%	$48.25	25.64%	$35.88				

Maximum reasonable rate is the higher of the SAC rate or the rate floor.

Rate floor to be determined by the parties once variable costs for each year are known.

Table F-7
Move I - Soda Ash from Westvaco, WY to Kansas City, MO (export--interchange)

Period	Existing Rate	Rate Inflator	Inflated Rate	Rate Reduction	SAC Rate	Rate Floor (180% R/VC)		Maximum Reasonable Rate	
						RR Car	Pvt Car	RR Car	Pvt Car
3rd Q 97	$32.35			1.60%	$31.83				
4th Q 97	$32.35			1.60%	$31.83				
1st Q 98	$32.35			6.78%	$30.16	$16.42	$23.94	$30.16	$30.16
2nd Q 98	$32.35			6.78%	$30.16	$16.42	$23.87	$30.16	$30.16
3rd Q 98	$32.35			6.78%	$30.16	$16.11	$23.67	$30.16	$30.16
4th Q 98	$32.35			6.78%	$30.16		$23.56	$30.16	$30.16
1999	$32.67			9.52%	$29.56				
2000		0.74%	$32.91	12.17%	$28.91				
2001		0.89%	$33.20	14.58%	$28.36				
2002		0.93%	$33.51	15.88%	$28.19				
2003		0.82%	$33.79	16.72%	$28.14				
2004		0.82%	$34.07	0.46%	$33.91				
2005		0.82%	$34.34	15.56%	$29.00				
2006		0.82%	$34.63	16.36%	$28.96				
2007		0.82%	$34.91	15.85%	$29.38				
2008		0.82%	$35.20	18.40%	$28.72				
2009		0.82%	$35.49	18.84%	$28.80				
2010		0.82%	$35.78	19.62%	$28.76				
2011		0.82%	$36.07	2.32%	$35.23				
2012		0.82%	$36.37	18.96%	$29.47				
2013		0.82%	$36.66	20.02%	$29.32				
2014		0.82%	$36.96	20.57%	$29.36				
2015		0.82%	$37.27	23.77%	$28.41				
2016		0.82%	$37.57	24.76%	$28.27				
2017		0.82%	$37.88	25.64%	$28.17				

Maximum reasonable rate is the higher of the SAC rate or the rate floor.

Rate floor to be determined by the parties once variable costs for each year are known.

Table F-8
Move J - Soda Ash from Westvaco, WY to Kansas City, MO (domestic --interchange)

Period	Existing Rate	Rate Inflator	Inflated Rate	Rate Reduction	SAC Rate	Rate Floor (180% R/VC) RR Car	Rate Floor (180% R/VC) Pvt Car	Maximum Reasonable Rate RR Car	Maximum Reasonable Rate Pvt Car
3rdQ97	$35.95			1.60%	$35.37				
4thQ97	$35.95			1.60%	$35.37				
1stQ98	$35.95			6.78%	$33.51		$28.60		$33.51
2ndQ98	$35.95			6.78%	$33.51		$28.75		$33.51
3rdQ98	$35.95			6.78%	$33.51		$28.78		$33.51
4thQ98	$35.95			6.78%	$33.51		$28.53		$33.51
1999	$36.31			9.52%	$32.85				
2000		0.74%	$36.58	12.17%	$32.13				
2001		0.89%	$36.90	14.58%	$31.52				
2002		0.93%	$37.25	15.88%	$31.33				
2003		0.82%	$37.55	16.72%	$31.27				
2004		0.82%	$37.86	0.46%	$37.69				
2005		0.82%	$38.17	15.56%	$32.23				
2006		0.82%	$38.48	16.36%	$32.19				
2007		0.82%	$38.80	15.85%	$32.65				
2008		0.82%	$39.12	18.40%	$31.92				
2009		0.82%	$39.44	18.84%	$32.01				
2010		0.82%	$39.76	19.62%	$31.96				
2011		0.82%	$40.09	2.32%	$39.16				
2012		0.82%	$40.42	18.96%	$32.75				
2013		0.82%	$40.75	20.02%	$32.59				
2014		0.82%	$41.08	20.57%	$32.63				
2015		0.82%	$41.42	23.77%	$31.57				
2016		0.82%	$41.76	24.76%	$31.42				
2017		0.82%	$42.10	25.64%	$31.31				

Maximum reasonable rate is the higher of the SAC rate or the rate floor.

Rate floor to be determined by the parties once variable costs for each year are known.

Table F-9
Move K - Soda Ash from Westvaco, WY to Portland, OR (export)

Period	Existing Rate	Rate Inflator	Inflated Rate	Rate Reduction	SAC Rate	Rate Floor (180% R/VC)		Maximum Reasonable Rate	
						RR Car	Pvt Car	RR Car	Pvt Car
3rd Q 97	$32.36			1.60%	$31.84				
4th Q 97	$32.36			1.60%	$31.84				
1st Q 98	$32.36			6.78%	$30.17	$18.67	$25.47	$30.17	$30.17
2nd Q 98	$32.36			6.78%	$30.17	$19.40	$26.19	$30.17	$30.17
3rd Q 98	$32.36			6.78%	$30.17	$18.63	$25.70	$30.17	$30.17
4th Q 98	$32.36			6.78%	$30.17		$25.81		$30.17
1999	$32.36			9.52%	$29.28				
2000		0.74%	$32.60	12.17%	$28.63				
2001		0.89%	$32.89	14.58%	$28.09				
2002		0.93%	$33.20	15.88%	$27.92				
2003		0.82%	$33.47	16.72%	$27.87				
2004		0.82%	$33.74	0.46%	$33.59				
2005		0.82%	$34.02	15.56%	$28.73				
2006		0.82%	$34.30	16.36%	$28.69				
2007		0.82%	$34.58	15.85%	$29.10				
2008		0.82%	$34.86	18.40%	$28.45				
2009		0.82%	$35.15	18.84%	$28.53				
2010		0.82%	$35.44	19.62%	$28.48				
2011		0.82%	$35.73	2.32%	$34.90				
2012		0.82%	$36.02	18.96%	$29.19				
2013		0.82%	$36.32	20.02%	$29.05				
2014		0.82%	$36.61	20.57%	$29.08				
2015		0.82%	$36.91	23.77%	$28.14				
2016		0.82%	$37.22	24.76%	$28.00				
2017		0.82%	$37.52	25.64%	$27.90				

Maximum reasonable rate is the higher of the SAC rate or the rate floor.

Rate floor to be determined by the parties once variable costs for each year are known.

Table F-10
Move D - Sodium Bi- and Sesquicarbonate from Westvaco, WY to Irondale, IL

						Rate Floor (180% R/VC)		Maximum Reasonable Rate	
Period	Existing Rate	Rate Inflator	Inflated Rate	Rate Reduction	SAC Rate	RR Car	Pvt Car	RR Car	Pvt Car
3rd Q 97	$49.00			1.60%	$48.22	$35.37	$43.45	$48.22	$48.22
4th Q 97	$49.00			1.60%	$48.22		$37.66		$48.22
1st Q 98	$49.00			6.78%	$45.68		$40.68		$45.68
2nd Q 98	$49.00			6.78%	$45.68		$39.19		$45.68
3rd Q 98	$49.00			6.78%	$45.68		$42.37		$45.68
4th Q 98	$49.00			6.78%	$45.68		$44.32		$45.68
1999	$49.49			9.52%	$44.78				
2000		0.74%	$49.86	12.17%	$43.79				
2001		0.89%	$50.30	14.58%	$42.97				
2002		0.93%	$50.77	15.88%	$42.71				
2003		0.82%	$51.18	16.72%	$42.63				
2004		0.82%	$51.60	0.46%	$51.37				
2005		0.82%	$52.03	15.56%	$43.93				
2006		0.82%	$52.45	16.36%	$43.87				
2007		0.82%	$52.88	15.85%	$44.50				
2008		0.82%	$53.32	18.40%	$43.51				
2009		0.82%	$53.75	18.84%	$43.63				
2010		0.82%	$54.20	19.62%	$43.56				
2011		0.82%	$54.64	2.32%	$53.37				
2012		0.82%	$55.09	18.96%	$44.64				
2013		0.82%	$55.54	20.02%	$44.42				
2014		0.82%	$55.99	20.57%	$44.48				
2015		0.82%	$56.45	23.77%	$43.03				
2016		0.82%	$56.92	24.76%	$42.82				
2017		0.82%	$57.38	25.64%	$42.67				

Maximum reasonable rate is the higher of the SAC rate or the rate floor.

Rate floor to be determined by the parties once variable costs for each year are known.

Table F-11
Move F - Sodium Bi- and Sesquicarbonate from Westvaco, WY to Chicago, IL (interchange)

Period	Existing Rate	Rate Inflator	Inflated Rate	Rate Reduction	SAC Rate	Rate Floor (180% R/VC) RR Car	Rate Floor (180% R/VC) Pvt Car	Maximum Reasonable Rate RR Car	Maximum Reasonable Rate Pvt Car
3rd Q 97	$39.27			1.60%	$38.64		$36.22		$38.64
4th Q 97	$39.27			1.60%	$38.64		$31.34		$38.64
1st Q 98	$39.27			6.78%	$36.61		$30.31		$36.61
2nd Q 98	$39.27			6.78%	$36.61		$31.86		$36.61
3rd Q 98	$39.27			6.78%	$36.61		$31.61		$36.61
4th Q 98	$39.27			6.78%	$36.61		$32.87		$36.61
1999	$39.66			9.52%	$35.88				
2000		0.74%	$39.95	12.17%	$35.09				
2001		0.89%	$40.31	14.58%	$34.43				
2002		0.93%	$40.68	15.88%	$34.22				
2003		0.82%	$41.02	16.72%	$34.16				
2004		0.82%	$41.35	0.46%	$41.16				
2005		0.82%	$41.69	15.56%	$35.21				
2006		0.82%	$42.03	16.36%	$35.16				
2007		0.82%	$42.38	15.85%	$35.66				
2008		0.82%	$42.73	18.40%	$34.87				
2009		0.82%	$43.08	18.84%	$34.96				
2010		0.82%	$43.43	19.62%	$34.91				
2011		0.82%	$43.79	2.32%	$42.77				
2012		0.82%	$44.15	18.96%	$35.78				
2013		0.82%	$44.51	20.02%	$35.60				
2014		0.82%	$44.87	20.57%	$35.64				
2015		0.82%	$45.24	23.77%	$34.49				
2016		0.82%	$45.61	24.76%	$34.32				
2017		0.82%	$45.99	25.64%	$34.20				

Maximum reasonable rate is the higher of the SAC rate or the rate floor.

Rate floor to be determined by the parties once variable costs for each year are known.

Table F-12
Move L - Phosphorus from Don, ID to Westvaco, WY

Period	Existing Rate	Rate Inflator	Inflated Rate	Rate Reduction	SAC Rate	Rate Floor (180% R/VC) T-104	Rate Floor (180% R/VC) T-644	Maximum Reasonable Rate T-104	Maximum Reasonable Rate T-644
3rd Q 97	$30.90			1.60%	$30.41	$20.70	$22.39	$30.41	$30.41
4th Q 97	$30.90			1.60%	$30.41	$20.72	$22.61	$30.41	$30.41
1st Q 98	$30.90			6.78%	$28.81	$21.01	$22.93	$28.81	$28.81
2nd Q 98	$30.90			6.78%	$28.81	$20.86	$22.84	$28.81	$28.81
3rd Q 98	$30.90			6.78%	$28.81	$20.72	$22.72	$28.81	$28.81
4th Q 98	$30.90			6.78%	$28.81	$20.75	$22.73	$28.81	$28.81
1999	$31.21			9.52%	$28.24				
2000		3.40%	$32.27	12.17%	$28.34				
2001		2.53%	$33.09	14.58%	$28.26				
2002		2.13%	$33.79	15.88%	$28.43				
2003		2.13%	$34.51	16.72%	$28.74				
2004		2.13%	$35.25	0.46%	$35.09				
2005		2.13%	$36.00	15.56%	$30.40				
2006		2.13%	$36.76	16.36%	$30.75				
2007		2.13%	$37.55	15.85%	$31.60				
2008		2.13%	$38.35	18.40%	$31.29				
2009		2.13%	$39.16	18.84%	$31.79				
2010		2.13%	$40.00	19.62%	$32.15				
2011		2.13%	$40.85	2.32%	$39.90				
2012		2.13%	$41.72	18.96%	$33.81				
2013		2.13%	$42.61	20.02%	$34.08				
2014		2.13%	$43.52	20.57%	$34.57				
2015		2.13%	$44.44	23.77%	$33.88				
2016		2.13%	$45.39	24.76%	$34.15				
2017		2.13%	$46.36	25.64%	$34.47				

Maximum reasonable rate is the higher of the SAC rate or the rate floor.

Rate floor to be determined by the parties once variable costs for each year are known.

Table F-13
Move M - Phosphorus from Don, ID to Lawrence, KS

Period	Existing Rate	Rate Inflator	Inflated Rate	Rate Reduction	SAC Rate	Rate Floor (180% R/VC)		Maximum Reasonable Rate	
						T-104	T-644	T-104	T-644
3rd Q 97	$65.18			1.60%	$64.14	$53.62	$55.93	$64.14	$64.14
4th Q 97	$65.18			1.60%	$64.14	$49.91	$56.32	$64.14	$64.14
1st Q 98	$65.18			6.78%	$60.76	$50.42	$58.34	$60.76	$60.76
2nd Q 98	$65.18			6.78%	$60.76	$50.63	$58.21	$60.76	$60.76
3rd Q 98	$65.18			6.78%	$60.76	$50.15	$57.96	$60.76	$60.76
4th Q 98	$65.18			6.78%	$60.76	$50.27	$58.01	$60.76	$60.76
1999	$65.83			9.52%	$59.56				
2000		3.40%	$68.07	12.17%	$59.78	Maximum reasonable rate is the higher of the SAC rate or the rate floor. Rate floor to be determined by the parties once variable costs for each year are known.			
2001		2.53%	$69.79	14.58%	$59.61				
2002		2.13%	$71.28	15.88%	$59.96				
2003		2.13%	$72.80	16.72%	$60.62				
2004		2.13%	$74.35	0.46%	$74.00				
2005		2.13%	$75.93	15.56%	$64.11				
2006		2.13%	$77.55	16.36%	$64.86				
2007		2.13%	$79.20	15.85%	$66.65				
2008		2.13%	$80.89	18.40%	$66.00				
2009		2.13%	$82.61	18.84%	$67.04				
2010		2.13%	$84.37	19.62%	$67.81				
2011		2.13%	$86.16	2.32%	$84.17				
2012		2.13%	$88.00	18.96%	$71.32				
2013		2.13%	$89.87	20.02%	$71.88				
2014		2.13%	$91.79	20.57%	$72.91				
2015		2.13%	$93.74	23.77%	$71.46				
2016		2.13%	$95.74	24.76%	$72.04				
2017		2.13%	$97.78	25.64%	$72.71				

Table F-14
Move N - Phosphorus Movements from Don, ID to Chicago, IL (interchange)

Period	Existing Rate	Rate Inflator	Inflated Rate	Rate Reduction	SAC Rate	Rate Floor (180% R/VC)		Maximum Reasonable Rate	
						T-104	T-644	T-104	T-644
3rd Q 97	$88.59			1.60%	$87.17	$59.53	$69.73	$87.17	$87.17
4th Q 97	$88.59			1.60%	$87.17	$58.37	$68.44	$87.17	$87.17
1st Q 98	$88.59			6.78%	$82.58	$61.15	$70.87	$82.58	$82.58
2nd Q 98	$88.59			6.78%	$82.58	$60.61	$70.69	$82.58	$82.58
3rd Q 98	$88.59			6.78%	$82.58	$60.32	$70.27	$82.58	$82.58
4th Q 98	$88.59			6.78%	$82.58	$61.00	$70.33	$82.58	$82.58
1999	$89.48			9.52%	$80.96				
2000		3.40%	$92.52	12.17%	$81.26				
2001		2.53%	$94.86	14.58%	$81.03				
2002		2.13%	$96.88	15.88%	$81.50				
2003		2.13%	$98.95	16.72%	$82.40				
2004		2.13%	$101.05	0.46%	$100.59				
2005		2.13%	$103.21	15.56%	$87.15				
2006		2.13%	$105.41	16.36%	$88.16				
2007		2.13%	$107.65	15.85%	$90.59				
2008		2.13%	$109.94	18.40%	$89.71				
2009		2.13%	$112.29	18.84%	$91.13				
2010		2.13%	$114.68	19.62%	$92.18				
2011		2.13%	$117.12	2.32%	$114.40				
2012		2.13%	$119.61	18.96%	$96.94				
2013		2.13%	$122.16	20.02%	$97.71				
2014		2.13%	$124.76	20.57%	$99.10				
2015		2.13%	$127.42	23.77%	$97.13				
2016		2.13%	$130.14	24.76%	$97.91				
2017		2.13%	$132.91	25.64%	$98.83				

Maximum reasonable rate is the higher of the SAC rate or the rate floor.

Rate floor to be determined by the parties once variable costs for each year are known.

Table F-15
Move O - Phosphate Rock from Dry Valley, ID to Don, ID

Period	Existing Rate	Rate Inflator	Inflated Rate	Rate Reduction	SAC Rate	Rate Floor (180% R/VC) RR Car	Pvt Car	Maximum Reasonable Rate RR Car	Pvt Car
3rd Q 97	$4.62			1.60%	$4.55	$3.56		$4.55	
4th Q 97	$4.62			1.60%	$4.55	$3.71		$4.55	
1st Q 98	$4.62			6.78%	$4.31	$3.47		$4.31	
2nd Q 98	$4.62			6.78%	$4.31	$3.49		$4.31	
3rd Q 98	$4.62			6.78%	$4.31	$3.58		$4.31	
4th Q 98	$4.62			6.78%	$4.31	$3.53		$4.31	
1999	$4.71			9.52%	$4.26				
2000		0.50%	$4.73	12.17%	$4.16				
2001		0.50%	$4.76	14.58%	$4.06				
2002		0.50%	$4.78	15.88%	$4.02				
2003		0.50%	$4.80	16.72%	$4.00				
2004		0.50%	$4.83	0.46%	$4.81				
2005		0.50%	$4.85	15.56%	$4.10				
2006		0.50%	$4.88	16.36%	$4.08				
2007		0.50%	$4.90	15.85%	$4.12				
2008		0.50%	$4.93	18.40%	$4.02				
2009		0.50%	$4.95	18.84%	$4.02				
2010		0.50%	$4.98	19.62%	$4.00				
2011		0.50%	$5.00	2.32%	$4.88				
2012		0.50%	$5.03	18.96%	$4.07				
2013		0.50%	$5.05	20.02%	$4.04				
2014		0.50%	$5.08	20.57%	$4.03				
2015		0.50%	$5.10	23.77%	$3.89				
2016		0.50%	$5.13	24.76%	$3.86				
2017		0.50%	$5.15	25.64%	$3.83				

Maximum reasonable rate is the higher of the SAC rate or the rate floor.

Rate floor to be determined by the parties once variable costs for each year are known.